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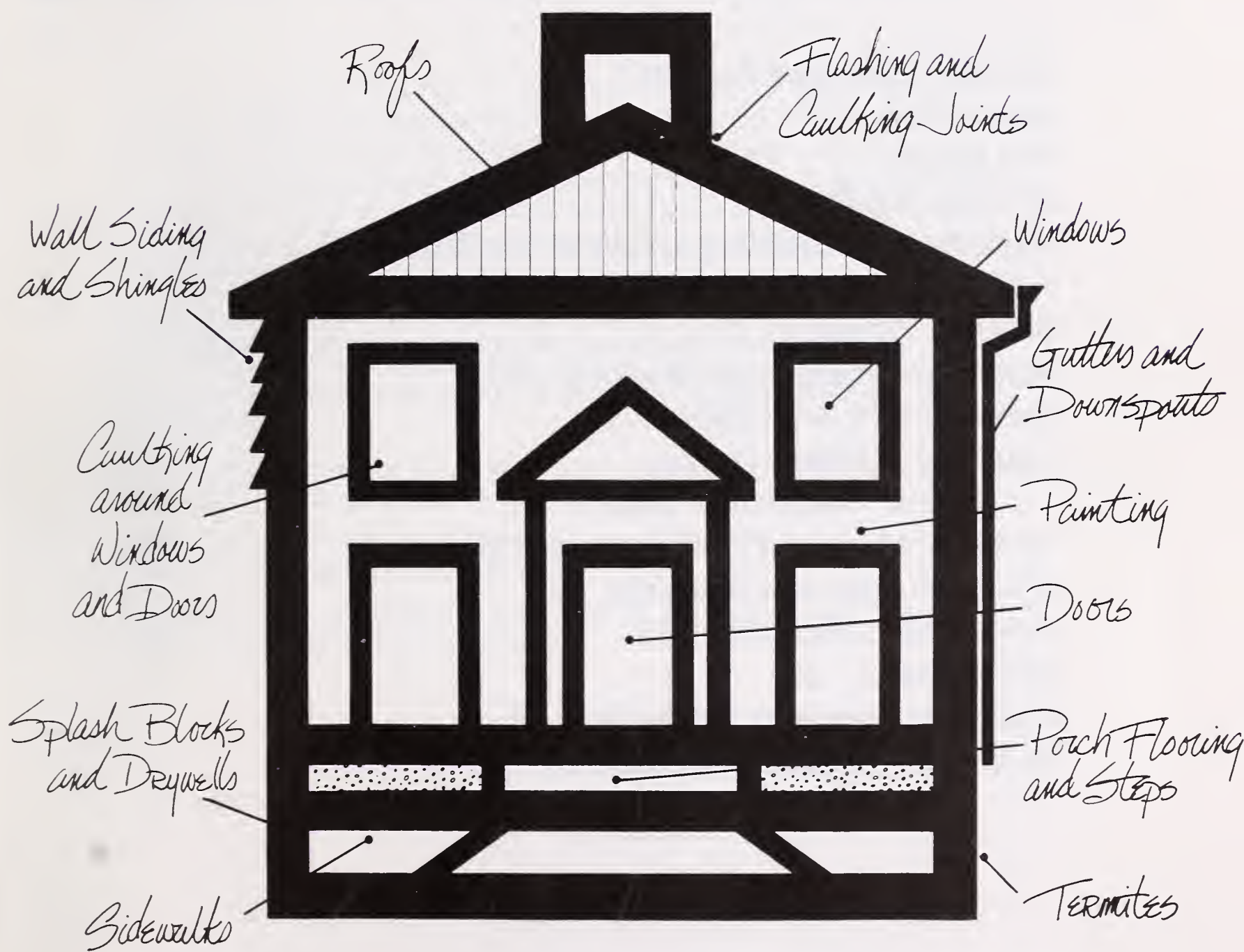


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# Simple Home Repairs . . . Outside



# Simple Home Repairs...

## Outside

has been prepared in easy, step-by-step sections to help even the most inexperienced person do simple home repair jobs or teach others.

Although this series of directions has been grouped in one publication, each section is designed so that it can be easily reproduced as a separate leaflet for teaching purposes.

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# Should You Make Repairs?

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Owning a home has long been an American dream. For most buyers, the purchase of that home represents their most significant lifetime investment. Most people know the initial cost of a house, but many are not aware of the continuing cost of maintaining and repairing it. As costs of materials and labor increase, more home owners are assuming the role of "handyman." This publication is to help you, step by step, with your outside repair jobs.

The chief reason for repairs is to maintain and improve the condition of the building to prevent its deterioration and loss in value.

Examine your house once a year. Its parts and materials wear out with use and time.

Houses grow old. Know the condition of materials under the surface. Hidden damage or decay could become a serious problem.

Do not do repairs and maintenance piecemeal. Make a plan. The parts of a house depend on and affect each other.

After you have examined your house, decide whether you will make repairs yourself or call a professional.

# Assuming the Role of “Handyman”

To decide whether you should make the repair, or hire an expert, answer these questions:

- What type of repair must be made?
- What is the extent of the repair?
- What are your actual or potential skills?
- How much time will it take?
- How important is the repair compared to your time?
- What will it cost?
- Are reputable repairmen available and what are their prices?
- Are standard types of materials required and are they readily available to you?
- Will the repair require more materials than labor, or more labor than materials?
- How much will you save if you do the work yourself?

Consider time. Don't begin a repair unless you have time to do it right.

Base your planning on your own abilities, not those of your neighbors. Is there someone you can pay for advice if you become “stumped”?

Once you begin a repair and invest time and money, don't expect that a repairman will come in and finish the job for substantially less than what he would have originally charged.

Avoid the cost of repeating the same repair because you used faulty materials or procedures.

## Choosing a Professional Repairman

Did you decide to hire help?

Before you contact a repairman, figure out the kind and quality of the repair needed. This can improve communication between you and him and reduce misunderstandings. It can fortify you against “switcheroo” tactics in which a lower price is offered in the beginning to “sell” you and then you're persuaded into switching to a more costly product.

Contracting for work, having it done, and getting satisfactory results can be a trying experience even with a reputable repairman. For your benefit and his, put your agreement in writing. Do not rely upon “reputation of honesty,” “word of honor,” or “verbal understanding.”

To reach a clear and binding agreement, you should know and write down in detail what you expect for the amount of money you are to pay. This means writing a specification. (Or have the repairman prepare it.)

The specification should be brief and to the point. Don't overspend, but plan to use quality materials since labor will often be your main cost.

The specification will vary slightly depending upon the nature of the repair. It should include:

1. The exact location and extent of the repair.
2. Indication of any repairs that are to be made beforehand, if the job involves new work (for example, putting new siding on the house).
3. Type and quality of materials to be used.
4. Color and sizes of materials.
5. Number of coats to be applied, if painting.
6. Agreement that the work shall conform to local and state codes.

An agreement between the contractor and owner should be executed. The agreement describes:

1. All material, labor, and equipment necessary for the job.
2. When the job is to be completed.
3. Who cleans up the mess that results from the job.
4. The amount in which the repairman or contractor shall assume responsibility for damage to your property or that of your neighbors.
5. That any changes in the contract shall be made in writing and agreed to by both parties.
6. That the agreement frees you from all liens that may be placed against the job for failure of the contractor-repairman to pay for materials, labor, equipment, etc.
7. The schedule of how and when payments are to be made.

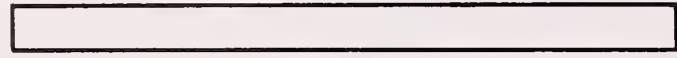
Try to select a repairman or contractor whose work you know. Examine some of his previous work and ask the owners if they are satisfied. If you need help, consult with an architect, businessman, or the Better Business Bureau in your area. Seek at least three bids before you choose a contractor.

The contract should show the cash price. If you are not paying cash, it should show the cash down payment, the unpaid balance, the amount financed, and the total number of payments. This will show you the amount of money you are paying for financing, above the cost of the work.

You may wish to check on the work in progress. However, stay out of the way. Interference can cause delays, affect the quality of the work, or cause disagreements and added costs.

Inspect the project with the repairman when the job is done. If there are questions, refer to the contract. Sign off on the contract and make final payment after all the work has been completed correctly.

# Basic Tools



You'll need a few basic tools for most home maintenance jobs, and some special tools for special jobs. Some are expensive, and are not needed very often. Is there a place where you can borrow or rent those?

Here are some basic tools and materials you may need for doing simple repairs on the outside of your house.

## Nail Set

A *nail set* is a small metal device used to sink the heads of nails slightly below the surface you are driving them into (fig. 1).

## Squares

The *framing square* is a handy measuring tool for lining up materials evenly and making square corners. It is usually metal (fig. 2).

The *try square* is smaller and is also used for lining up and squaring material. One side is made of wood and is not marked to measure with (fig. 3).

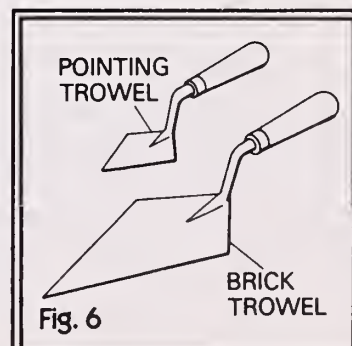
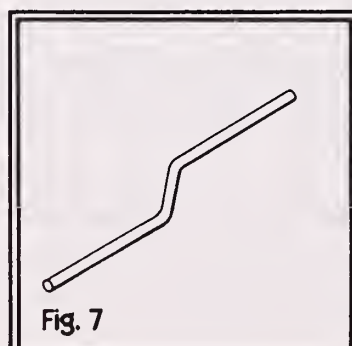
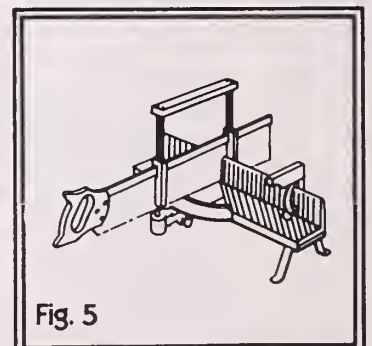
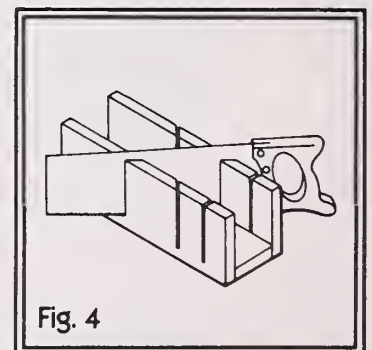
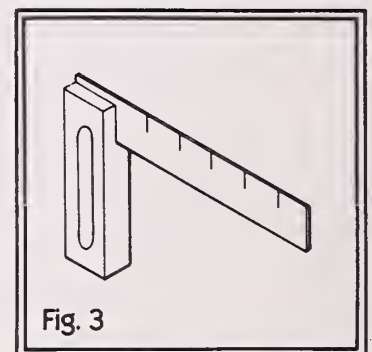
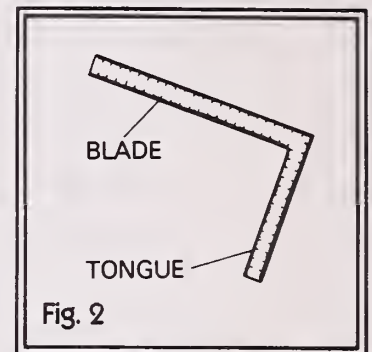
## Miter Box

With a *miter box*, you can saw off a piece of board at an exact angle. It may be of wood, to use with a separate saw (fig. 4). Or it may be steel, with the saw set in the steel box (fig. 5).

## Masonry Trowels and Jointer

The *trowel* is used to build or repair masonry walls, sidewalks, etc. It has a flat, thin, steel blade set into a handle. The "brick trowel" is the larger and is used for mixing, placing, and spreading mortar. The smaller "pointing trowel" is used to fill holes and repair mortar joints (fig. 6). This process is called "pointing."

The *jointer* is another masonry tool, used to finish joints after the wall is laid (fig. 7). Finish joints are made on the outside of a masonry wall to make it more waterproof and to improve appearance. The "V" and "concave" joints are the most weather tight. A different type of jointer is needed for each type of joint used.



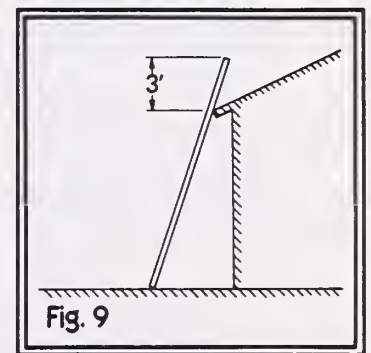
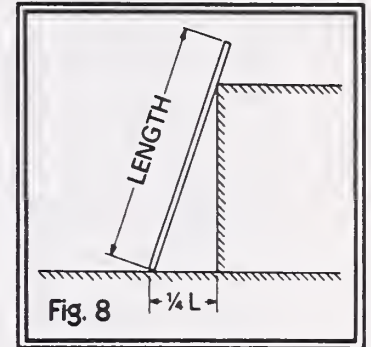
## Ladders

Both a *single portable ladder* and a *stepladder* are needed for home repairs. Proper placement of the portable ladder is very important, for safety.

The single ladder consists of one section and rests against a surface. An extension ladder will be necessary for working at heights of more than 15 feet.

The base of the ladder should be placed so that the distance from the wall is equal to one-fourth of the length of the ladder (fig. 8). Take the following precautions when using the ladder:

1. The ladder should have a nonslip base if you use it on smooth or sloping surfaces.
2. Never let the ladder rest against window panes or glass doors.
3. Before using the ladder, check treads and side rails to make sure they are sound and tight.
4. Is the ladder long enough? At least two treads, or about 3 feet, should extend above the point to which you need to climb (fig. 9). This is important, since you should not climb over the top of the ladder.
5. When climbing or coming down, always face the ladder and use both hands (fig. 10). Raise or lower your materials and tools with a rope and sling.
6. Never lean from a ladder. If something is beyond safe and easy reach, move the ladder to the proper location.
7. Never leave the ladder standing, except for short breaks in your work. When you finish work for the day, take the ladder down and put it aside out of the way.
8. The stepladder is self-supporting and can be used in more ways (fig. 11). Don't use a stepladder over 12 feet high.



## Portable Power Circular Saws

The *portable power circular saw* can save you “muscle power” and time (fig. 12). You can rent or buy one. It may be used as a crosscut saw or a rip saw — depending upon the type of blade used.

The *saw blade* should be adjusted so that the amount of blade that extends below the “shoe” is slightly greater ( $1/16$  to  $1/8$  inch) than the thickness of material to be cut. As you guide the saw forward, the blade is exposed for cutting (fig. 13).

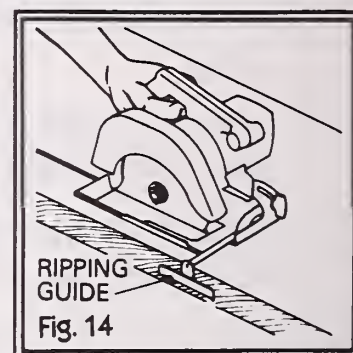
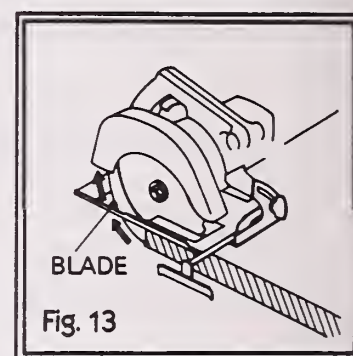
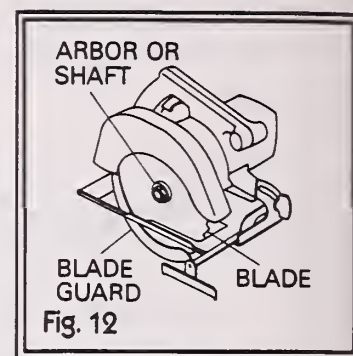
For ripping work, circular saws come with a “ripping guide.” After adjusting the blade, set the ripping guide the same distance from the saw as the width of the material to be cut off.

Then place the guide against the edge of the piece as you cut (fig. 14).

For crosscutting, or cutting off material, turn the ripping guide upside down, so that it will be out of the way. Using a framing square and pencil, draw a line to mark where to cut. Then guide the saw blade carefully along the line.

Using a portable power saw can save much time and effort. For safety and the proper use of the saw, follow these steps:

1. Make sure that the saw you use is equipped with a guard that will automatically adjust in use so that none of the teeth are exposed above the work.
2. Make sure the saw is equipped with an automatic power cutoff button.
3. Always wear goggles or face mask when using a power saw.
4. Carefully examine the material and make certain that it is free of nails or other metal before you start cutting.
3. Grasp the saw with both hands and hold it firmly against the work.
6. Never overload the saw motor by pushing too hard or cutting material that is too thick for this small saw.
7. Always try to make a straight cut to keep from binding the saw blade. If it does bind, back the saw out slowly and firmly in a straight line. As you continue with the cutting, adjust the direction of the cut so that you are cutting in a straight line.
8. Always pull the electric plug before you make any adjustments to the saw or inspect the blade.



# Flat Roofs

## Your Problem

- A leaking roof.
- The seam or edge of an overlapping felt is loose.
- Cracks or damage appear in the roofing.
- A blister has developed in the felt.

## What You Need

- Sheet or asphalt roofing felt
- Asphalt roofing cement
- Hammer and roofing nails
- Putty knife
- Utility knife
- Paint brush

## How-To:

Locate the leak as closely as possible from inside. Place and secure the ladder, then examine the condition of the roof from the outside.

### Loose Felt Edges

Using a brush, clean out any dirt that may have blown under the loose felt (fig. 1). Then, using broad-head roofing nails, nail loose felt in place. Start nailing away from the felt edge and work toward the edge, to prevent making a blister in the felt. Place the nails 1 to 1/2 inches apart (fig. 2).

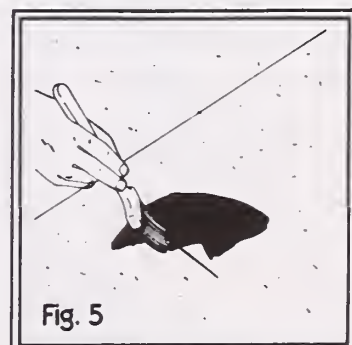
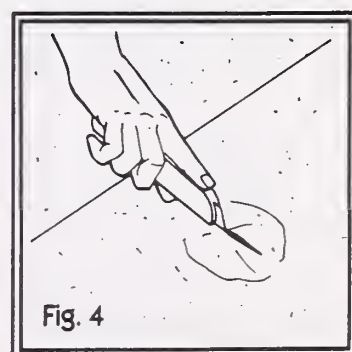
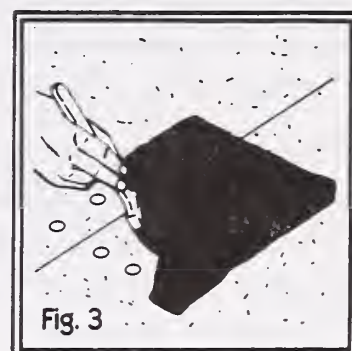
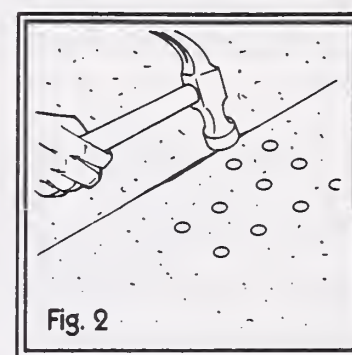
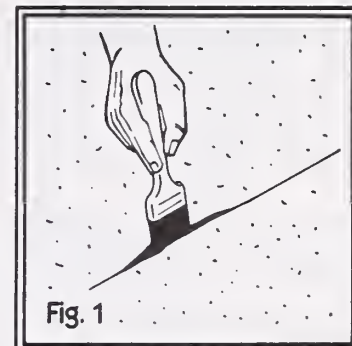
After the felt is nailed in place, cover the patched area with asphalt cement. Make sure the cement extends 1 to 1 1/2 inches beyond the repair area (fig. 3).

### Blisters in the Felt

Using a knife, cut the blister (fig. 4). Then put asphalt cement into the area, similar to filling a crack. Continue, using the repair procedures for cracks. (See steps 2 and 3 below.)

### Cracks in the Roofing

1. Clean out the crack and the area around the crack.
2. Using the brush or putty knife, place a thin layer of asphalt cement over the crack. The cement should completely cover the cleaned area around the crack (fig. 5).



3. Cut a piece of roofing felt a little larger than the crack. Place it over the cement and press it firmly in place. Nail the edges on the felt piece, spacing the nails 1 to 1½ inches apart (fig. 6). Spread another layer of cement over the felt piece. Make sure the cement extends 1 to 1½ inches beyond all edges of the felt piece (fig. 7).

### **Deteriorated or Damaged**

This condition is harder to repair. Never build up or cover the old or damaged roofing with a series of felt layers. This may change the drainage pattern of the roof and create more problems.

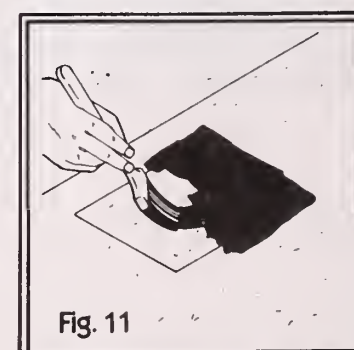
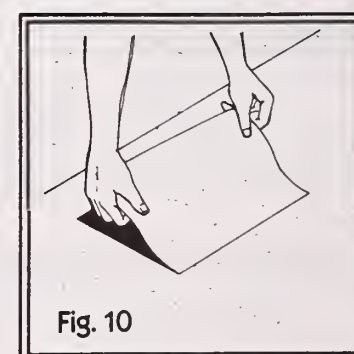
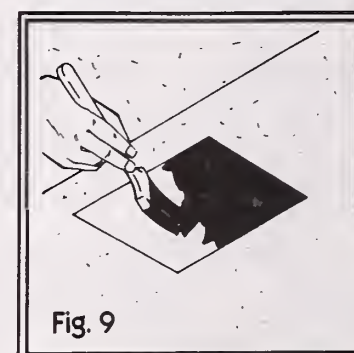
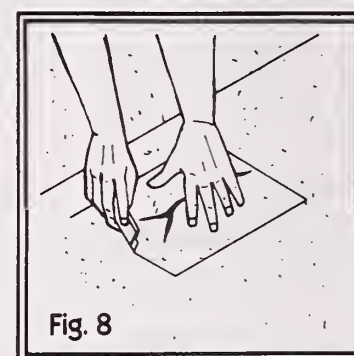
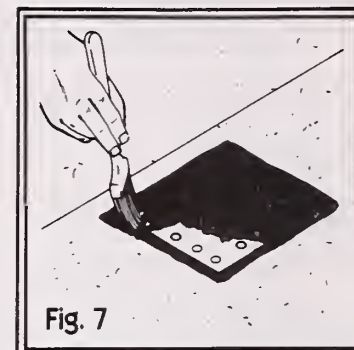
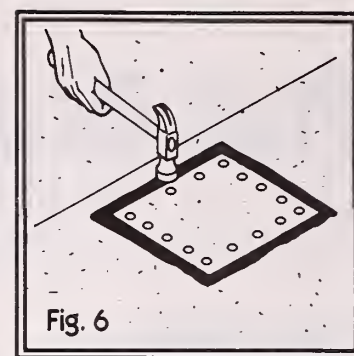
Remove damaged roofing (fig. 8). Cut out damaged felt in a rectangle. Clean the surfaces in and around the cut-out area.

Now cut pieces of felt to neatly fit the cut-out area. The number of felt strips placed should equal the number of layers of felt removed. Cut the top patch 2 to 3 inches larger so that it will overlap the cut-out area on all sides.

Spread a thin layer of asphalt cement over the cut-out area (fig. 9). Then take the first felt strip, place it into the cut-out area, and press it firmly into place (fig. 10). Now spread a thin layer of cement over that strip. Then place and firmly press down a second felt strip. Continue placing strips this way until the cut-out area is level with the original roofing.

After the cut-out area has been built up to its original level, spread a thin layer of cement over the cut-out area. Spread the cement so that it extends 3 to 4 inches beyond all edges of the area (fig. 11).

Place the oversized felt strip over the cement and press it firmly in place. Using broad-head roofing nails, nail the strip along all four edges. (Similar to fig. 6.) Then cover the strip with cement, making sure that the cement extends 1 to 1½ inches beyond all edges of the strip. (Similar to fig. 7.)



# Shingle Roofs

## Your Problem

- A leaking roof.
- Damaged or missing shingles. **CAUTION:** If in doubt, call a roofing specialist (especially for very steep roofs and complicated repairs).

## What You Need

- Two ladders (one for climbing to the roof and one for work on top of the roof)
- Replacement shingles
- Asphalt roofing cement
- Roofing nails
- Small pieces of sheet metal
- Claw hammer
- Hacksaw
- Small trowel

## How-To: Wood Shingles

1. If the roof leaks, find the location of the leak as nearly as possible from inside.
2. Place and secure the ladder.
3. Examine the condition from the outside.
4. If the shingle is cracked, it is better to repair the crack rather than replace the shingle. Repair the crack like this:

If the crack is small, ( $\frac{1}{4}$  inch or less) pull out loose splinters so that only the large, solid pieces remain. Check the roofing material under the shingles to determine where the nails should go. Sometimes shingles are nailed to wood slats spaced 4 or 5 inches apart (fig. 1). Sometimes they are nailed to wood sheathing.

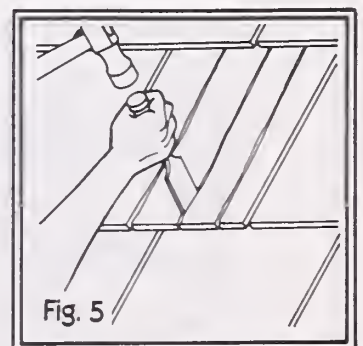
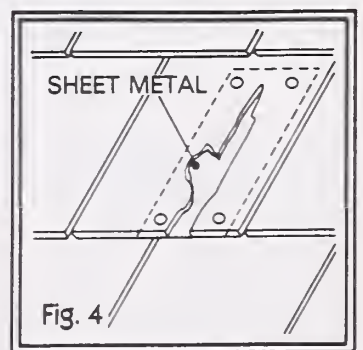
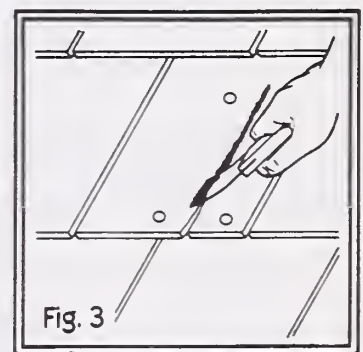
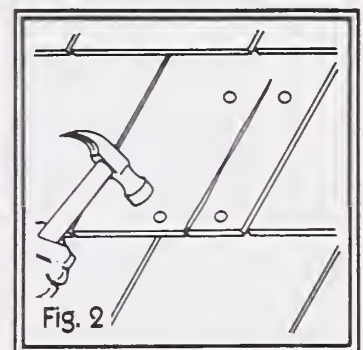
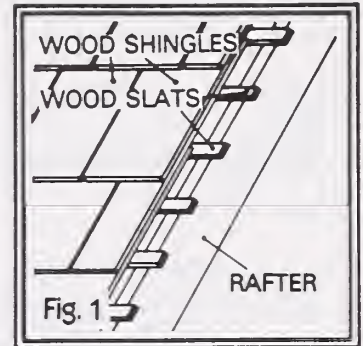
After the loose splinters are removed, butt the solid pieces tightly together and nail the split shingle together with galvanized roofing nails (fig. 2). Do not drive the heads of the nails into the shingle and damage its surface!

Cover the crack fully with asphalt roofing cement. Apply a dab of cement over the nailheads (fig. 3).

If the crack is wide, add a sheet metal patch. To do this, drive a square piece of sheet metal up under the cracked shingle (fig. 4). Make sure that the top of the sheet metal goes beyond the upper edge of the crack. Now complete the job as described above for the small crack.

5. If shingles are damaged beyond repair, replace them. This can be more tricky than repairing a cracked shingle (fig. 5).

Remove the damaged shingle. Using a screwdriver or chisel, cut the



damaged shingle into smaller pieces that can be removed by pulling with your fingers.

Using a hacksaw blade, cut the nails off flush with the wood slats or sheathing (fig. 6). Since shingles overlap, you may have to pry up the shingle above enough to get at all the nails. Take care not to crack the good shingle.

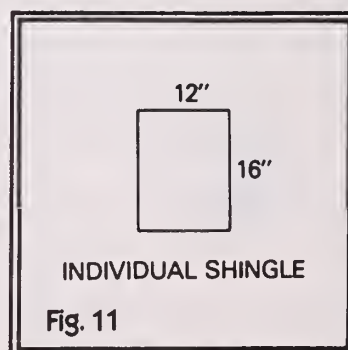
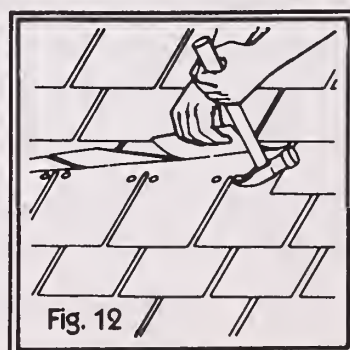
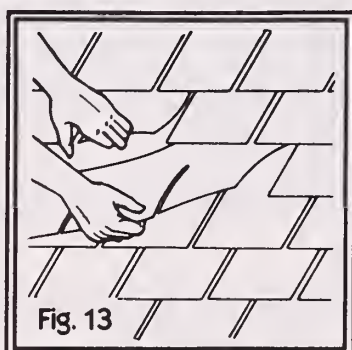
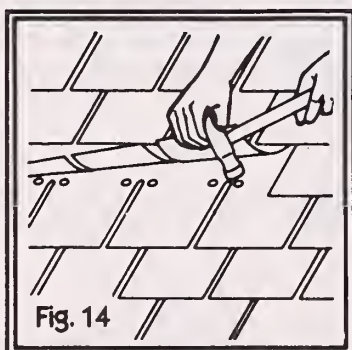
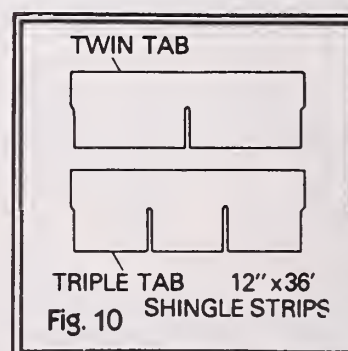
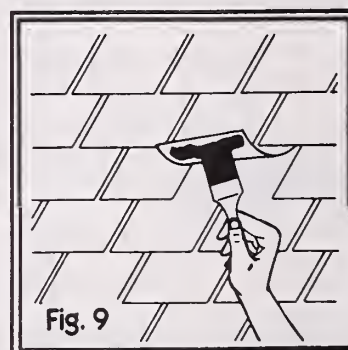
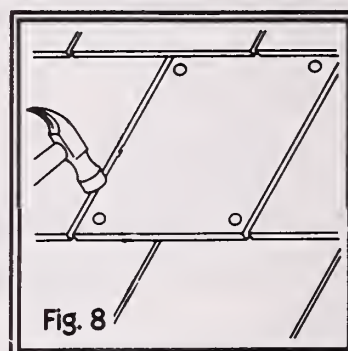
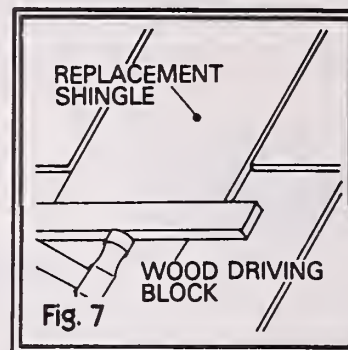
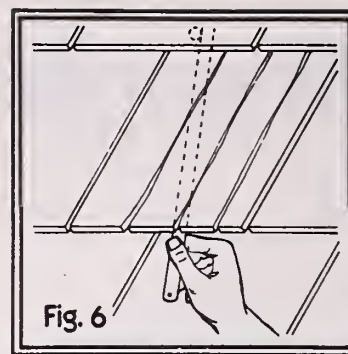
Measure the empty space and cut a replacement shingle to fit the space.

Using a block of wood and hammer, drive the replacement shingle into place (fig. 7).

Nail the new shingle in place with galvanized roofing nails (fig. 8). Apply a dab of asphalt cement to cover the nailheads.

### How-To: Asphalt Shingles

1. Locate the damaged area and examine the condition.
2. If the shingle does not need replacing, simply raise the damaged or torn shingle and apply an ample amount of asphalt cement to the underside (fig. 9). Now press the shingle firmly into place and nail it down with broad-headed, galvanized roofing nails. (Always remember to apply asphalt cement to the nailheads.)
3. If the shingle needs replacing, select a strip the same as the piece to be replaced. Your asphalt roofing will usually come in shingle strips (fig. 10). Some roofing is in single, separate shingles (fig. 11).
4. Raise the shingles above the damaged one. Pull the nails from the damaged shingles with the claw hammer (fig. 12). If nails cannot be reached with a hammer, cut them off with a hacksaw blade.
5. Remove the damaged shingle. Slip the new shingle into place (fig. 13).
6. Nail the new shingle in place with broad-headed, galvanized roofing nails. Place 2 nails to each tab; this means 6 nails to each full shingle strip (fig. 14). The shingle should be "blind nailed." That is, the nails should be covered by the upper shingles when they are lowered into place.
7. Apply a dab of asphalt cement over the nailheads and lower the upper shingles into place.



# Flashing and Caulking Joints at the Roof

## Your Problem

- The roof is leaking.
- The house is being damaged by water.
- Flashing joints have become unsealed.
- The flashing has rusted or deteriorated.

## What You Need

- Ladder
- Copper, galvanized steel, or aluminum flashing (16-ounce sheets)
- Butyl caulking compound
- Asphalt roofing cement
- Aluminized caulking compound
- Putty knife
- Chisel (small, narrow blade, with a steel-capped handle)
- Hammer and roofing nails of same metal as flashing
- Shears (metal cutting)

## How-To: Around Chimney

### Loose Mortar Joints:

Examine the masonry joints to see if the water leaks are due to crumbling or loose mortar in the joints (fig. 1). If so, fill and repair the cracks. (Use the procedures described in "Caulking and Filling Cracks Around Windows and Doors.")

### Faulty Flashing Joints:

If the leak is due to loose mortar where the flashing enters the brickwork, the repair is a simple one. First, clean any dirt out of the joint. Then, using the putty knife, spread a heavy layer of asphalt cement over the joint (fig. 2). Make sure that the cement extends  $\frac{1}{2}$  inch above the joint (onto the brick) and  $\frac{1}{2}$  inch below the joint (onto the flashing).

### Faulty Flashing:

The flashing has two parts, the lower part or *base flashing* and the upper part or *counter flashing*.

The *base flashing* will be built into the shingles (or other roofing material) along the sides of the chimney, and turned up against the chimney brickwork (figs. 3, 4, 5). Repairing this base flashing can be complicated; it's best to call a professional roofer for this.

### Lower Side of Chimney:

You can repair the *counter flashing* (fig. 6). To repair the counter flashing on the lower side of the chimney, it is best to cover the existing counter

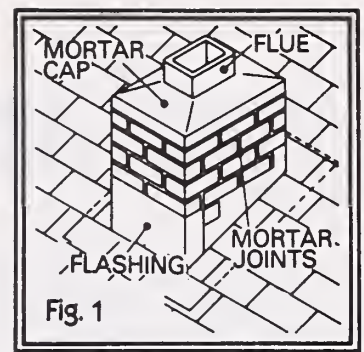


Fig. 1

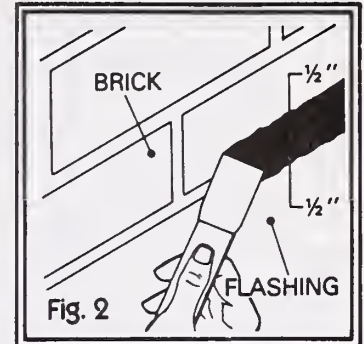


Fig. 2

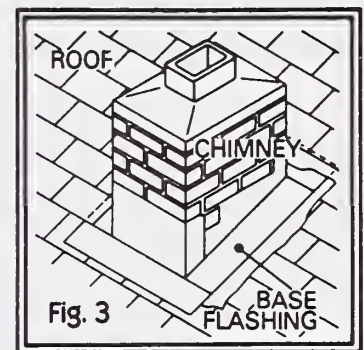


Fig. 3

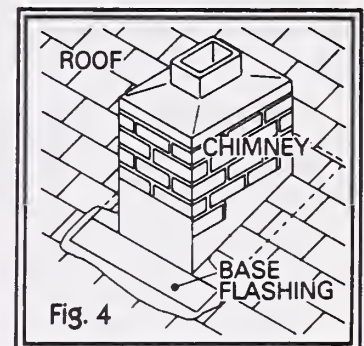


Fig. 4

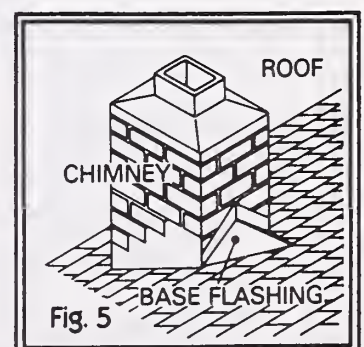


Fig. 5

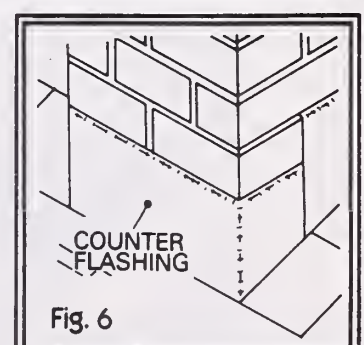


Fig. 6

flashing with a new strip rather than attempt to remove the old strip. (The old flashing will be imbedded into the mortar joint at a depth of at least 3 inches.)

1. First, using the hammer and chisel, chip out the mortar from the joint to a depth of at least 1 inch, along the full width of the chimney and around the corner a distance of 4 inches.

2. Measure the width of the chimney. Now, using the shears, cut a rectangular strip of flashing. Cut the strip 10 inches wide and make the length equal to the width of the chimney, plus 8 inches to allow for end folds that will wrap around the corners of the chimney.

3. Now fold the strip at each end, a distance of 4 inches from the end, to make the end folds. This shape now forms an "apron" that will fit around the end of the chimney (fig. 7). Cut a portion of the end folds off at an angle similar to the slope of the roof, along the sides of the chimney (fig. 8). The angle that is cut should match the existing counter flashing apron that is being covered.

4. Using the shears again, cut the top of the apron at the corners of the end folds, a distance of 1 inch (fig. 9). Now, fold the top edge of the apron at the 1-inch depth to form the flashing portion that is to be inserted into the joint (fig. 10). Try it to see that it fits properly.

5. Clean any loose dirt from the old flashing. Using the putty knife, spread a layer of *aluminized* caulking compound on the back side of the new flashing apron, including the end folds and the flashing edge that fits into the joints (fig. 11).

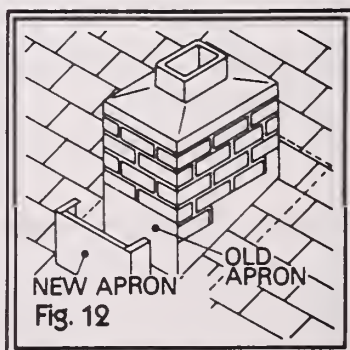
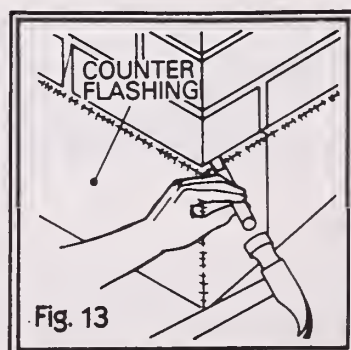
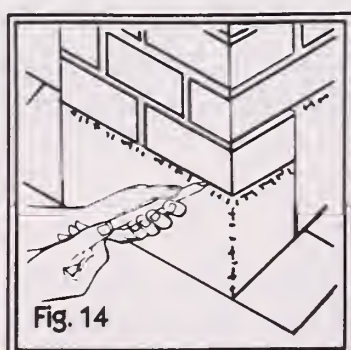
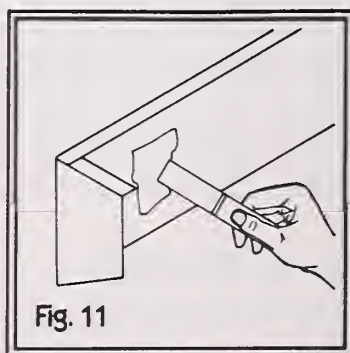
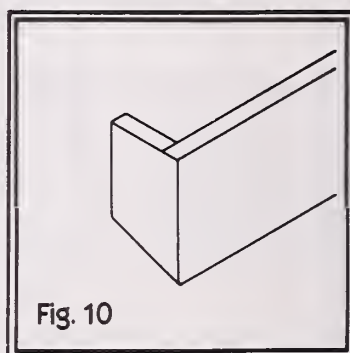
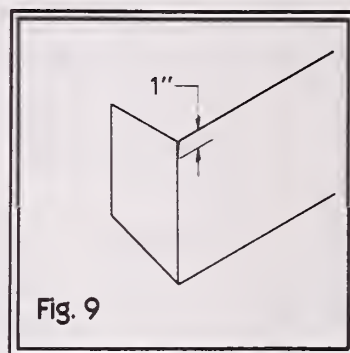
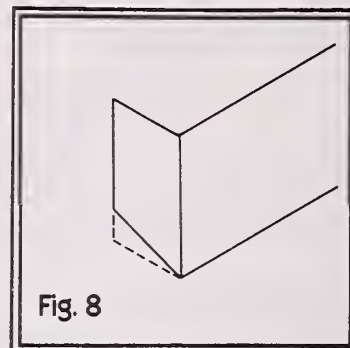
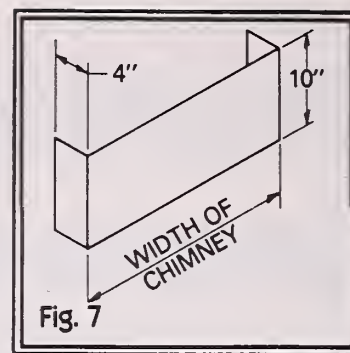
6. Now, place the new flashing apron over the old flashing and press into place (fig. 12). Using the chisel, run the flat side of the tip along the inside of the joint and seal the flashing in the joint in place (fig. 13). Make sure that the new flashing apron is held tight or braced tight against the old flashing long enough for the caulk to set (fig. 14).

7. Fill the joint with mortar. After the mortar has set, spread a layer of *asphalt* cement along the joint. Also, apply a layer of *asphalt* cement to the vertical edges of apron.

### Sides of Chimney

If the faulty flashing is located at the *sides of the chimney*, this condition will require "stepping" the flashing (fig. 15). Make the repair according to steps 1 through 7 above, except for the following variations:

(a) In step 1, remove the mortar from both the horizontal and vertical joints in which the old flashing is imbedded.



(b) In steps 2 and 3, cut the strip to a length to allow for 4-inch end folds and cut the strip out in the "step" fashion similar to the existing flashing.

(c) In step 3, do not cut off the bottom of the end folds.

(d) In step 4, make sure that both vertical and horizontal edges of the apron are cut and folded to fit into the joints.

### Cracks around the Chimney Flue.

Clean the joint free of all loose caulk and other debris. Using the *butyl* type caulking compound (gun form or rope form), seal the joint between the flue and the chimney mortar cap, and any cracks in the surface of the mortar cap (fig. 16). Also, seal the joint between the cap and the top course of bricks (fig. 17).

**Vertical Walls that Penetrate the Roof.** Walls that penetrate the roof are usually built of wood and are covered with siding. The following procedures apply to walls covered with siding and a roof surfaced with shingles (fig. 18).

**Faulty or Defective Joints.** The joint where the wall siding and roofing meet will be sealed with flashing but will not normally be caulked. Examine the joint. If the flashing appears to be in good condition, the water leaks may be due to seepage through the joint, independent of the flashing. If this is the case, using caulking compound (gun or rope form), seal the joint along its full length (fig. 19).

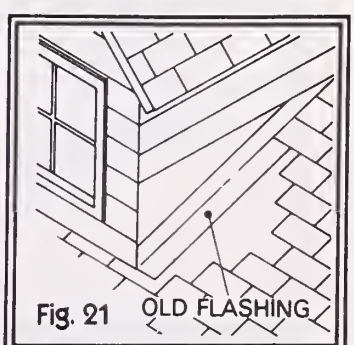
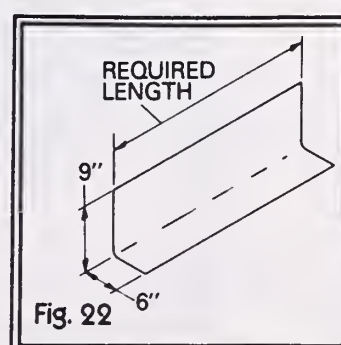
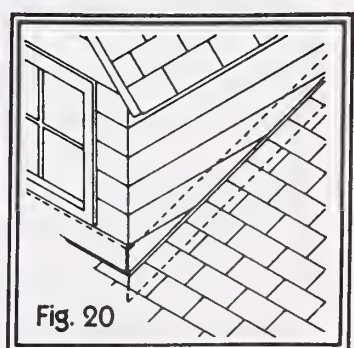
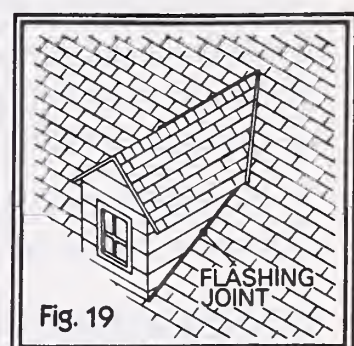
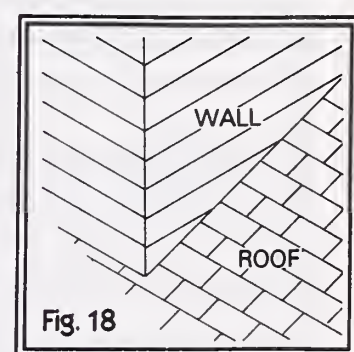
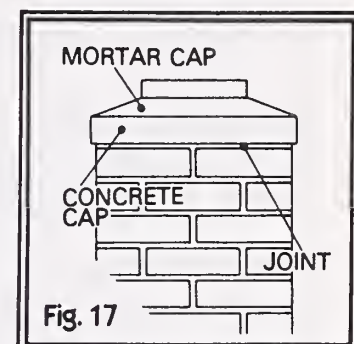
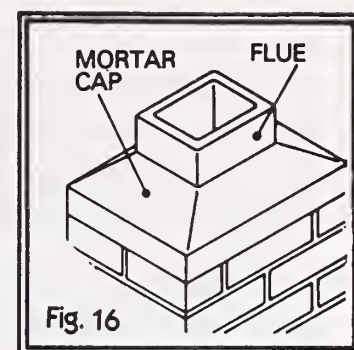
### Faulty or Defective Flashing

The intersections of walls and roofs are flashed similarly to chimneys, except the counter flashing is omitted since the base flashing is turned up under the siding or other wall covering (fig. 20). If the flashing is faulty, both the siding and shingles must be removed along the joint.

1. First, using the hammer and chisel, remove the siding to expose the standing edge of the flashing. If the roof is flat at this point, only one or two boards of siding will require removal. If the roof forms a slope along the wall, several boards must be removed.

2. Now remove each overlapping strip of shingles along the wall to fully expose the flashing (fig. 21). Clean the area free of all debris.

3. Cut a piece of flashing 15 inches wide and the required length to cover the defective flashing. Fold the piece to make one side 6 inches wide and the other 9 inches wide (fig. 22).



4. Place the 6-inch side of the new piece of flashing over the roof portion of the existing flashing and nail it into place using roofing nails (fig. 23). Cover the nailheads with asphalt roofing cement. Also, seal the ends of the new flashing with asphalt cement.

5. Place the remaining portion of the new flashing up against the wall portion of the existing flashing and nail it into place (fig. 24). Apply asphalt cement.

6. Replace the roofing shingles and wall siding boards.

### Plumbing Vents

1. Plumbing vents are flashed with a specially made device consisting of a circular collar soldered to a flat sheet (fig. 25).

2. If the leaks occur at the joint between the collar and the flat surface, seal the metal with aluminized caulking compound (fig. 26).

3. If the leaks occur between the flat metal surface and the roofing, make certain that the surface is properly nailed in place and then apply a heavy coat of asphalt roofing cement where the two join (fig. 27).

### Gravel Stops on Flat Roofs

1. Gravel stops are placed at the edge of the roof and may consist of 1-piece or 2-piece preformed device (fig. 28). The roofing felts overlap the flat portion of the gravel stop to provide the water seal.

2. If the roofing felts have loosened and lifted at the edge, make the repair by sealing the felts back in place with asphalt roofing cement applied to the underside of the felts (fig. 29). Then apply a coat of cement at the joint between the exposed top layer of felt and the standing portion of the gravel stop (fig. 30).

3. If greater damage has occurred at the joint or if the gravel stop is defective, call a professional roofer to make the repairs.

### Changes in Pitch of the Roof

Where a roof changes pitch, such as at valleys or adjoining porches, the flashing will normally be built in when roofing or shingles are put on. Such repair can be complicated. You may need to call a professional roofer for these repairs.

### Your Benefits

- No more moisture or water damage.
- More costly repairs are prevented later.

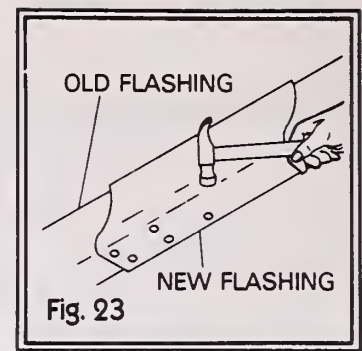


Fig. 23

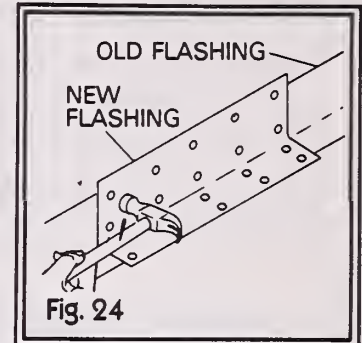


Fig. 24

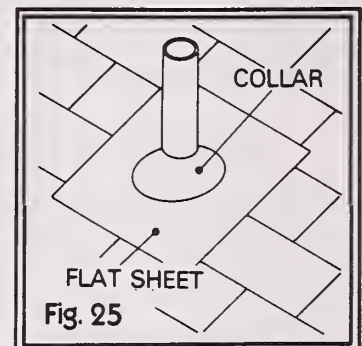


Fig. 25

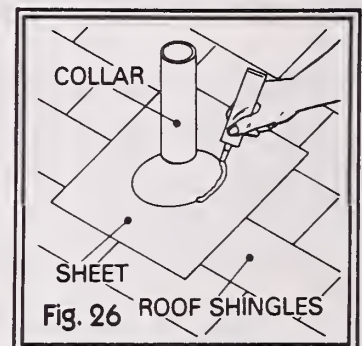


Fig. 26

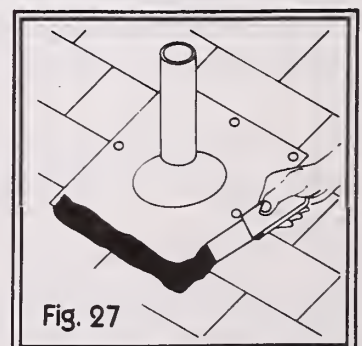


Fig. 27

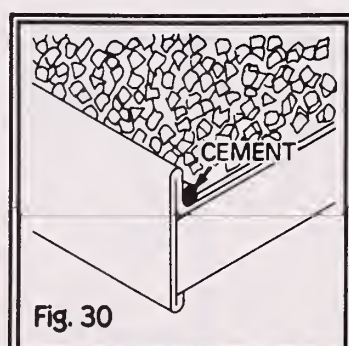


Fig. 30



Fig. 29

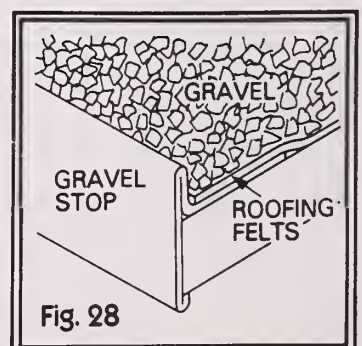


Fig. 28

# Wall Siding and Shingles

## Your Problem

- Boards or shingles are warped or split.
- Cracks have developed around knots.
- Holes have developed from loose knots.
- Boards or shingles are rotted or damaged.
- Air and moisture enter the wall.

## What You Need

- Replacement boards or shingles
- Building paper
- Siding and shingle nails (galvanized)
- Wood screws (galvanized)
- Asphalt cement
- Putty knife
- Paint (if required)
- Pry bar and chisel (steel-capped handle).
- Claw hammer
- Framing square
- Small hand drill and bit
- Measuring tape

## How-To: Warped Boards (or Wood Shingles)

1. Use screws, rather than nails, to straighten the warped board back in line. First, drill guide holes for the screws into the thicker portion of the board (fig.1). Then drill the larger holes to countersink the screws.
2. Now pull the warped board into line by tightening the screw into the sheathing (fig. 2). Cover the head of the screw with putty.

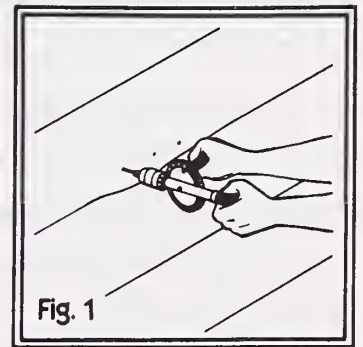


Fig. 1

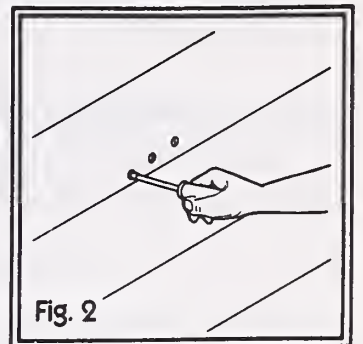


Fig. 2

## How-To: Split Boards (or Wood Shingles)

1. First, cut a piece of building paper to slip underneath the split board or shingle. Make it wide enough to fit between the in-place nails.
2. Butt the two halves of the split shingle tightly together. Then nail both halves into place with galvanized nails. Countersink the nailheads and cover them with putty.

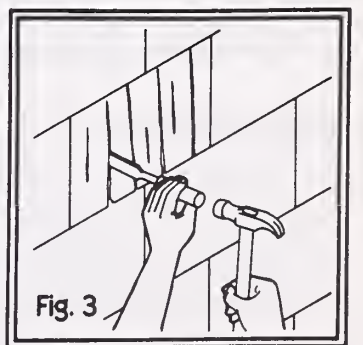


Fig. 3

## How-To: Replacing Damaged Wood Shingles

1. First, using the chisel and hammer, splinter the shingle into small, slender pieces (fig. 3). Carefully remove the splintered pieces so as not to damage the remaining shingles. Pull the exposed nails with a claw hammer.
2. Examine the building paper underneath and patch any tears or cuts with asphalt cement (fig. 4).

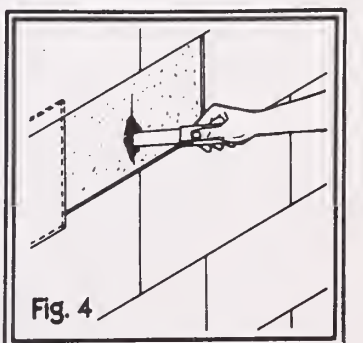


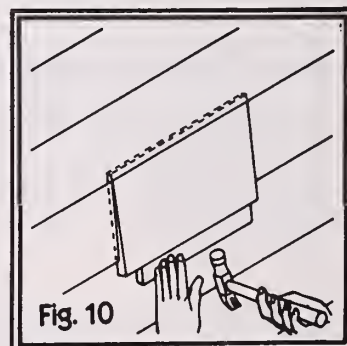
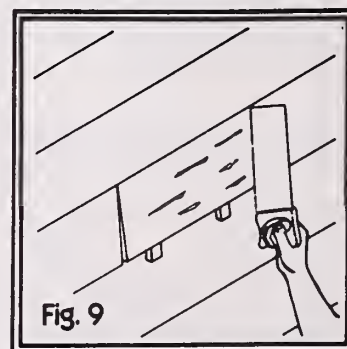
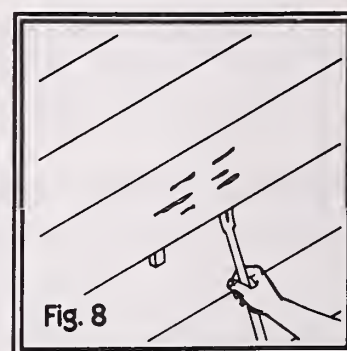
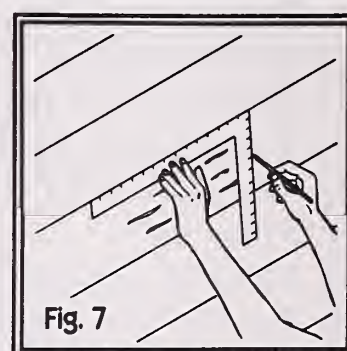
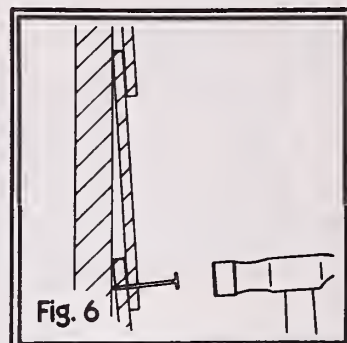
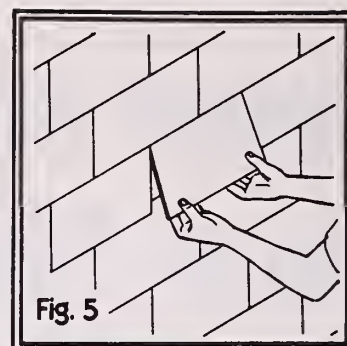
Fig. 4

3. Slip the new shingle into position (fig. 5). Nail the shingle in place with galvanized shingle nails (fig. 6).

### How-To: Repair Wood Siding

Instead of replacing the entire siding board, it is easier to cut out the damaged portion.

1. Using the square, mark the board for cut lines (fig. 7). Pry up the bottom edge of the board and insert wedges underneath (fig. 8).
2. Using the saw, cut out the damaged portion of the siding (fig. 9). Make the cut carefully. Don't damage siding boards above or below. Splinter the damaged portion into smaller pieces, using the hammer and chisel.
3. Now using the pry-bar or chisel, remove pieces. Remove remaining nails with the claw hammer.
4. Examine the building paper underneath. Patch any tears or cuts with asphalt cement. (Use asphalt cement sparingly, as too much will prevent "breathing" of the exterior.)
5. Measure the damaged board opening, mark the saw cut lines and cut the replacement board to fit the opening.
6. Slip the new board into position and drive it into place with the hammer. Hammer against a small wood block to avoid damaging the board (fig. 10).
7. Nail the board in place with galvanized siding nails, using the existing nailing pattern.



### How-To: Replace Asbestos Shingles

1. Remove the damaged shingle by simply shattering it with the hammer. If the shingle is not brittle enough to shatter, splinter it into pieces.
2. Remove the shingle pieces and the exposed nails.
3. Drill the nail holes in the new shingle at its lower edge. Position the holes like the old nail holes.
4. Continue the repair using step 2 and step 3 for wood shingles.

### Your Benefits

- Further deterioration of siding and shingles is prevented.
- Damage to other wall materials is prevented.
- Air and moisture don't penetrate.
- More costly repairs later are prevented.
- Appearance of the house is improved.

# Exterior Painting

## Your Problem

- Paint is blistering, cracking, scaling or peeling
- Wood or metal is deteriorating
- Appearance of the house is affected by fading paint

## What You Need

- Water-based and oil-based paints
- Paint primer (different for wood and metal)
- Linseed oil
- Solvent
- Wire brush and steel wool
- Paint scraper
- Cleaning solution for mildew
- Putty
- Wood sealer
- Caulking compound
- Putty knife
- Sandpaper
- Paint brushes
- Paint rollers
- Paint bucket and paddle (or stick)
- Two stepladders and cross planking
- Dropcloths
- Possible additional needs

## How Much Paint? What Kind?

Determine the type and amount of paint required. Measure the length and multiply to determine how many square feet you need to cover. Subtract for large openings such as picture windows and sliding glass doors. The paint container will tell how much surface the paint will cover. If mildew has been a problem, get a paint with a mildew inhibitor.

## Prepare the Surface

1. If the surfaces are free of defects, make sure that they are also completely dry and clean. Brush off loose dirt. If grease or oil stains remain after you use a detergent, try a solvent such as turpentine.
2. For best results, use the same type of paint (oil base or water base) as the old paint.
3. Caulk all holes and cracks.
4. Replace all damaged or decayed wood. For areas of suspected decay, check around windows, steps and posts, and under and around the eaves. Check downspouts and gutters and clean them before painting.
5. Prime all new wood with a paint primer. Seal any knot areas with a wood sealer after you apply the priming coat.

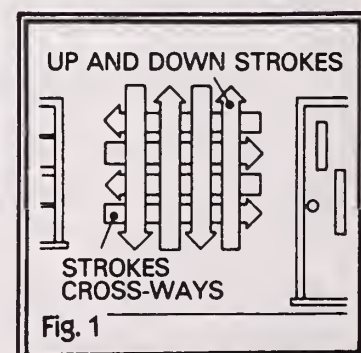
6. Clean rust from all metal areas, using a wire brush and steel wool. Then apply a metal primer to the areas cleared of rust.
7. Check all exposed nailheads for rust. Use steel wool to remove rust. Then sink the nails with a nail set, prime the nailhead with a rust-inhibiting primer and fill the nail hole with putty.
8. Clean off defective paint, using a scraper, wire brush or steel wool. For mildewed surfaces, wash the area thoroughly with an alkaline cleaning solution such as chlorine bleach. When defective paint is removed, apply a priming coat.
9. Smooth rough places with sandpaper.

### **Get Ready to Paint**

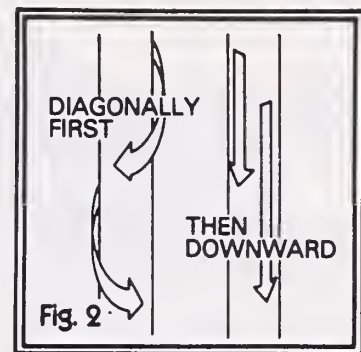
1. Choose a day for painting when rain or heavy winds are not expected. Don't plan to paint if the temperature is likely to be below 50°F., or above 90°F.
2. Follow the directions on the paint can.
3. Three-coat painting has traditionally been recommended on new surfaces. For old surfaces, two coats are recommended if painting is done every 5 years, or one coat if painting is done every 3 years. Note: several thin coats of paint look better and last longer than fewer thick coats.
4. For each coat, use paint from the same manufacturer.
5. Don't buy paint too far ahead of time, since ingredients, especially in oil paints, will settle in the bottom of the can when kept in storage. Your dealer can shake and mix the paint with a machine.
6. Avoid painting surfaces while they are exposed to direct sunlight.
7. Place dropcloths over areas or objects that may be damaged by paint drops.

### **Applying the Paint**

1. Make sure that the paint is thoroughly mixed. Oil paint should be stirred frequently during use.
2. It's best to paint from a small bucket. Pour only the amount needed from the original can and replace the cover each time.
3. Never dip the brush more than 1/3 the length of the bristles. Then pat off the excess paint. This will avoid dripping paint as you move the brush from the bucket to the surface.
4. Apply paint according to the manufacturer's directions.
5. Begin painting at the highest parts of the house and work downward. This will avoid paint spilling or dripping on surfaces already painted.
6. When painting flat surfaces, apply the paint first in long, horizontal strokes. Then cross the horizontal strokes by working up and down (fig. 1). This will give a completely covered surface, and use less paint.
7. To avoid brush marks, always end up the painting of an area by brushing back toward the area already painted.



8. When painting circular objects, such as downspouts, apply the paint first diagonally. Then cross the diagonal strokes by working downward along the long dimension (fig. 2).



9. Paint around edges with a brush before rolling the major surface.

10. A roller requires less skill and is faster than using a brush. A roller works best on large flat surfaces. Use a brush for small areas and trim work.

11. With a roller, apply the paint from a tray instead of a bucket.

12. Place the paint roller in the tray; roll it back and forth to fill the roller cover with paint. Remove the excess paint.

13. When rolling the paint on the surface, roll from the unpainted area into the painted area (fig. 3).



14. Apply a small amount of pressure with the final stroke. The roller will pick up any excess paint from the painted surface.

15. Make sure that each coat is thoroughly dry before beginning another coat.

### **Avoid Hazards**

1. Always follow the manufacturer's instructions regarding the toxic nature of paints. Keep paints and painting products away from children.
2. Keep the work area cleaned up before, during, and after the painting operation. Dispose of waste each day.
3. Make sure the ladder is secure. Do not overextend reach.

### **Your Benefits**

- Surfaces are protected from deterioration.
- The beauty and attractiveness of your house is restored.
- More costly repairs are avoided later.

# Screened Doors and Windows

## Your Problem

- Screen is damaged and cannot be patched.
- Screen is weakened from rust.
- Screen is torn from the frame.
- Wood frame is weak at the joints.
- Screw holes holding hinges have become enlarged from strain or rot.
- Door hinges are defective so that the door will not close properly.

## What You Need

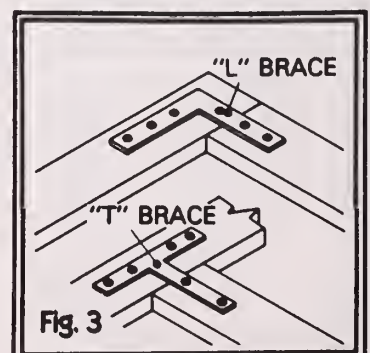
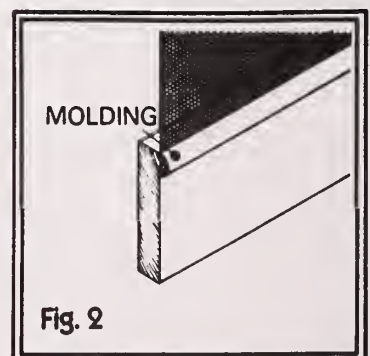
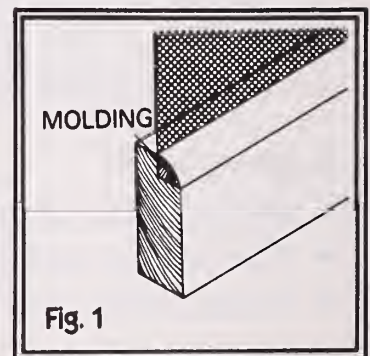
- New screen (16 mesh; for type, see step 1 below)
- Wood molding (1/2 inch by 1/2 inch quarter round, if required)
- Scrap lumber pieces (2 to 3 inches wide)
- Metal braces (T's and L's) and screws
- Butt type spring hinges and screws (if required)
- Wood filler (if required)
- Tacks
- 2d finishing nails
- Knife or razor blade
- Steel C-clamps (4 each)
- Small crosscut saw
- Try square (if required)
- Hammer
- Small screwdriver
- Work table or floor space big enough to work around the job

## How-To: Replacing Screen in Wood Frames

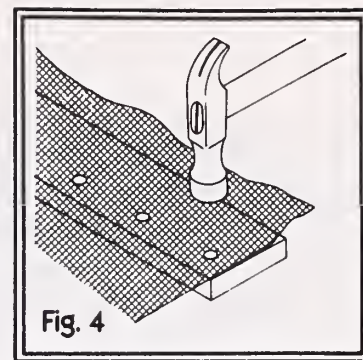
Aluminum, galvanized steel, or plastic screen are recommended, since they will not stain, rust, or need painting. Match other screening when practical. Examine the frame. Is the screen built into the frame (fig. 1), or attached to the edge of the frame with a molding trim piece (fig. 2)?

### For Screens Attached to the Frame:

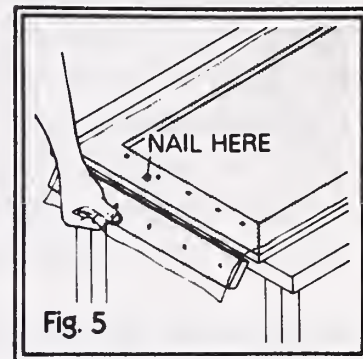
1. Measure the length and width of the screened opening. Cut screening 6 inches longer and 3 inches wider than the opening.
2. Remove door or window. Place on a flat surface. Remove the molding that holds the screen in place. Remove the old screen.
3. Examine the joints of the frame to see if they are sturdy and firm. If joints are weak reinforce them by placing L-type or T-type braces over each joint (fig. 3).



4. Carefully place new screen over the frame. Make sure the screen is aligned with the frame. The top of the screen should be 1 inch above the top of the opening. Staple or tack every 2 inches across the top of the screen (fig. 4).



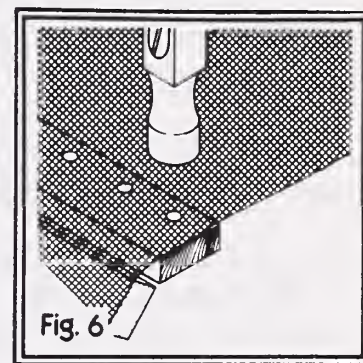
5. To pull screen tight lengthwise on the frame, place a board against the bottom of the frame. Nail screening to the board. Slip the frame to the edge of the table so that the board nailed to the screen can be bent downward. This tightens the screen for nailing (fig. 5).



6. Nail across the bottom every 2 inches. Nail sides and center rail. Cut away the excess screen. Replace molding. Attach molding with finishing nails.

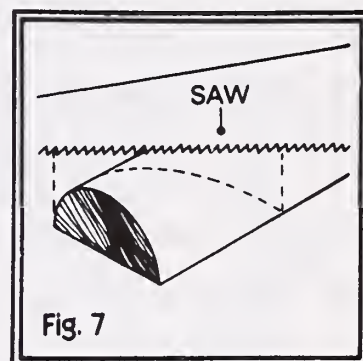
### If the Screen is Built Into the Frame:

1. First, follow steps 1 through 5 above. At step 6, nail the screen to the outer side of the frame (the outdoor side) (fig. 6).



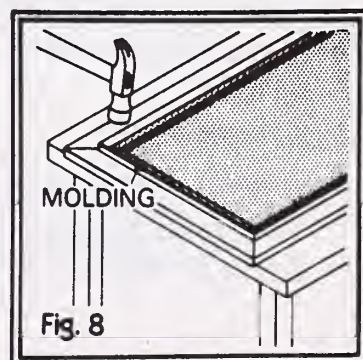
2. Measure the screened opening. Add 1 inch to this measurement and mark this length on a molding strip. Saw off the required length of molding.

3. Mark off a distance of 1/2 inch at each end of the molding strip. Using the saw, cut this portion off at a 45° angle to have mitered corners (fig. 7). Using the hammer and finishing nails, nail the molding over the screen along the inner edge of the frame surface (fig. 8).



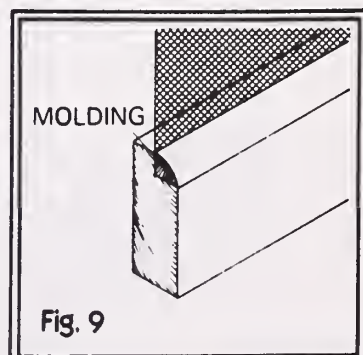
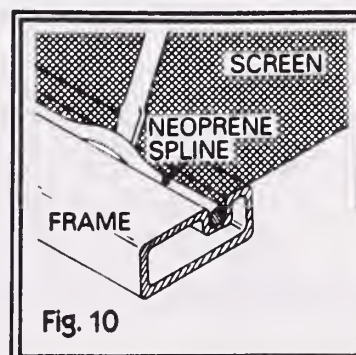
4. Repeat these steps for the opposite end and sides of the frame and also the center rail if you're repairing a screened door.

5. Remove the clamps and cut away the excess screen (fig. 9). Paint the new molding with two coats of paint.



### How-To: Replacing Screens in Metal Frames

1. First, use the procedures described (in steps 1 and 2) for wood frames. The screen usually will be held in place by a strip of neoprene (a type of synthetic rubber) forced into a groove of the frame (fig. 10). Using the screwdriver, carefully remove the neoprene strip, or spline, and remove the old screen.



2. Proceed as described in steps 4 and 5 for wood frames. Now with the screen taut and in place over the frame, fasten screen to the frame by replacing the neoprene spline in the grooves, using a screwdriver.
3. Remove the clamps and cut away the excess screen.

### How-To: Replacing Screen-Door Hinges

Examine the old door hinges to see what type you need. The hinge may be either a "loose pin" type that allows removal of the pin or a "fixed pin" type that does not. The hinges also may be the full surface-mounted type with the hinge fully exposed when the door is closed (fig. 11), or the half-surface mounted type in which the hinge is only partially exposed when the door is closed (fig. 12).

#### To Remove the Door from the Frame:

For loose-pin type hinges . . .

1. Remove the pin from both the top and bottom hinges by tapping the pin upward with a hammer and screwdriver (fig. 13).
2. Lay the door flat on the floor. Remove the hinge leaves attached to the door. Then remove the hinge leaves from the door jamb.

For the fixed-pin type hinges . . .

1. Remove the door by first removing the screws that attach the hinge leaves to the door frame. Lay the door down flat.
2. Unscrew the hinges from the door jamb.

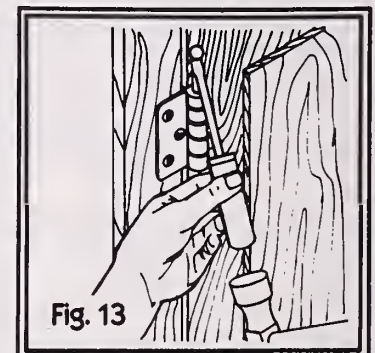
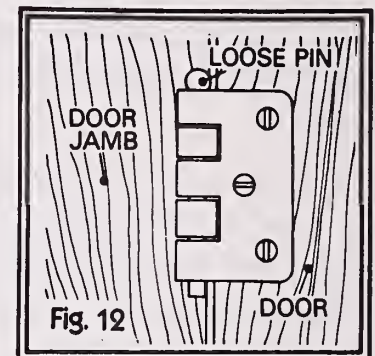
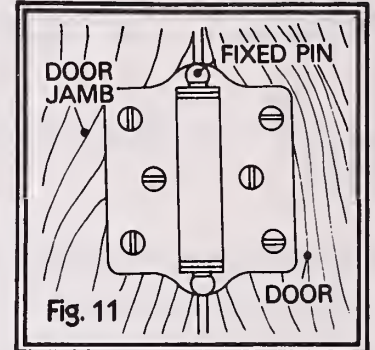
#### To Rehang the Door in the Frame:

For loose-pin and fixed-pin type hinges . . .

1. Place the new hinges on the door in the same location as the old hinges. Use slightly longer screws than the old ones, for a tighter fit.
2. Lift the door and place it in the door openings.
3. Using small wood strips or other scrap material, shim the door until it is in the proper position. Now attach the hinge to the door frame. Fill enlarged screw holes with a wood filler; let dry, and make new holes.

### Your Benefits

- Insects are kept out of the house.
- The house looks better.
- Screen door will not be damaged further.



# Storm Doors & Windows

## Your Problem

- Glass is cracked or broken.
- Glass is loose in the frame.
- Putty is cracked and loose.
- Air is coming through the window or door.

## What You Need

- Replacement glass (Grade "B" window-type glass, 3/32 inch thick)
- Putty (synthetic)
- Linseed oil
- Caulking mastic
- Solvent
- Paint (to match existing paint)
- Glazier's points
- Glass cutter, T-square and a smooth work surface (if glass is to be cut)
- Putty knife
- Small chisel and small screwdriver
- Hammer and nail set
- Paint brush (small, for trim work)

## How-To:

To repair storm doors and windows, you may need to replace cracked and loose putty in wood sashes, or replace cracked or broken glass in either wood or metal window and door frames. It's a good idea to use safety glass in storm doors, whether or not local building codes require it.

## Replacing Putty

Using the chisel, remove the cracked and loose putty from the frame (fig.1). Apply a coat of linseed oil to the exposed wood frame. Using putty knife, reseal the glass with a bead of putty or plastic glazing (fig. 2). Press the putty firmly in place to assure a tight seal. Allow approximately a week for the putty to dry, then paint it to match the existing trim. Follow the directions on the paint container.

## Replacing Glass in Wood Frames

1.(a) Measure the opening to be glazed. Subtract 1/16 inch to 1/8 inch from each of the two dimensions to allow for irregularities in the frame. The glass may be ordered cut to size or it can be cut using a glass cutter.

1.(b) If the glass is cut on the job, first lay the sheet of glass flat on a table. Mark the measurements on the glass with the glass cutter. Place a thin coat of turpentine on the glass cut line. Take care not to cut your hands on glass edges. Using the square as a guide, draw the cutter carefully and firmly along the cut line *only once* (fig. 3). Additional strokes of the cutter can break the glass. Move cut line to edge of table. Tap cut line lightly for a clean break.

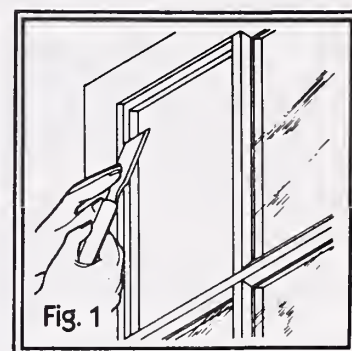


Fig. 1

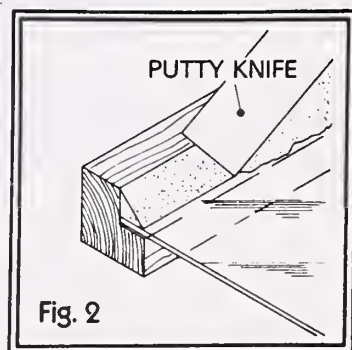


Fig. 2

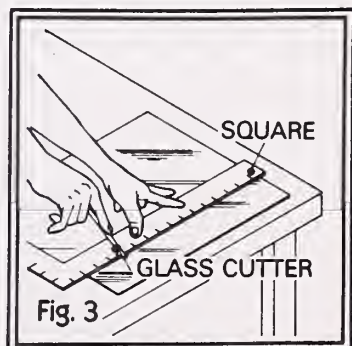


Fig. 3

2. Using the chisel, remove the damaged glass, old putty, and old glazier's points from the frame. Apply a coat of linseed oil to the frame. Using the putty knife, spread a thin layer of putty on all sides of the frame in which the glass is to rest (fig. 4). This "back-puttying" of the glass will assure a tight joint and also cushion the glass.

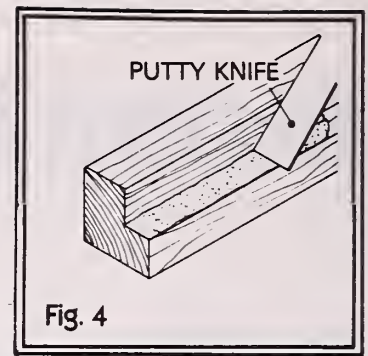


Fig. 4

3. Place the new glass in the opening and press it firmly against the bed of putty. Now place the glazier's points flat against the glass about every 8 inches and drive the points into the frame with a nail set and hammer (fig. 5). Make sure that at least 1/8 inch of the glazier's point is left projecting along the glass to hold the glass in place.



Fig. 5

4. Apply putty along the four edges of the glass and the outer edges of the frame or molding. Press the putty down firmly at an angle from the glass to the edge of the frame to provide a tight seal. Allow the putty to dry for at least a week, then paint it to match the existing trim.

### Replacing Glass in Metal Frames

This repair will depend upon the type of metal frame (sash) and the manner in which the glass is held in place. The most common types of frames used in residential construction will consist of one of the following:

(A) Frames in which the glass rests against a raised portion of the frame and is held in place by a "snap-in" glazing bead or strip that fits into a groove (fig. 6). Mastic or some form of rubber seal may be used to seal the glass.

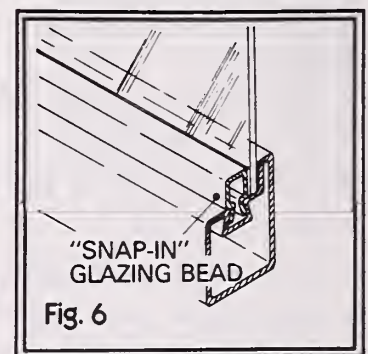


Fig. 6

(B) The glass is sandwiched between the two halves of the frame or sash and held together by rivets or screws. Some form of rubber seal, attached to each inside half of the frame, should be used to make the glass joint airtight (fig. 7).

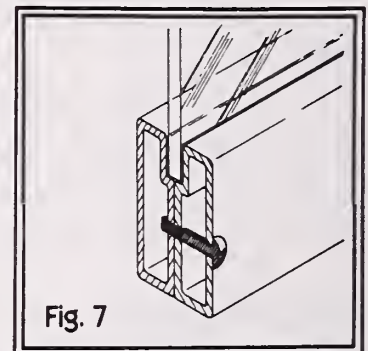


Fig. 7

If the frame is similar to type (A) above, first, use step 1.(a) and step 1.(b) for wood frames. Then proceed as follows:

Remove the glazing beads from the frame or sash with the tip of the screwdriver (fig. 8). Now carefully remove the damaged glass.

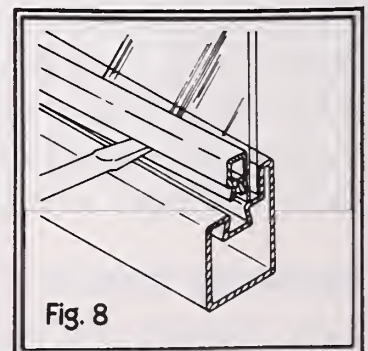
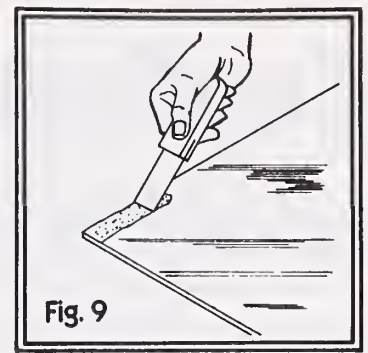


Fig. 8

If mastic has been used to seal the glass, remove the old mastic from both the frame and the glazing beads. Then clean both free of all grime, using a cloth soaked with a solvent.

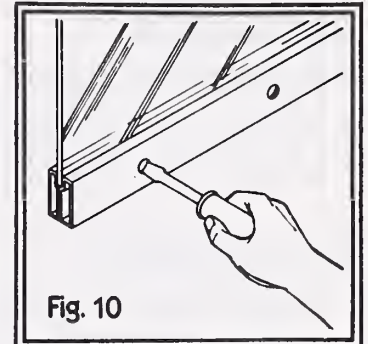
Using the putty knife, spread a layer of mastic on the frame where the glass is to rest. Place the new glass in the opening and press it firmly against the mastic. Now apply a heavy layer of mastic along the edge of the glass,  $\frac{1}{8}$  inch thick and a width equal to the raised portion of the glazing bead (fig. 9).



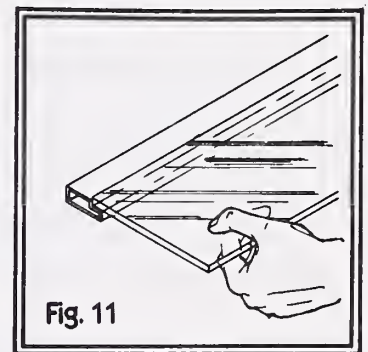
Carefully replace the glazing bead. Examine the edge of the bead to assure that the mastic is tight between the glass and the bead. Remove any excess mastic along the edge of the bead. Then use the cloth and solvent to finish the cleaning.

If the frame is similar to type (B) above, and is held together with screws, first use step 1.(a) and step 1.(b) for wood frames. Then continue, using the following procedures:

Remove the screws holding the two frame halves together (fig. 10). Then remove one of the frame halves. Carefully remove the damaged glass.



Place the new glass in the frame on the rubber seal (fig. 11). Now screw the two frame halves back together.



### **Your Benefits**

- Less heat loss during the winter.
- Less heat gain during the summer.
- Savings on heating and cooling costs.

# Caulking & Filling Cracks around Windows & Doors

## Your Problem

- Big heating and cooling bills.
- Moisture, dust, and dirt come through cracks.
- Insects enter the house through cracks.

## What You Need

- Putty (synthetic) and putty knife
- Caulking compound (polyvinyl acetate type, in both rope and bulk form)
- Packaged ready-mixed mortar (if repairing masonry walls)
- Solvent, such as cleaning fluid
- Small pointing trowel
- Chisel (small, narrow blade, with a steel-capped handle)
- Masonry joint finishing tool (if repairing masonry walls and the existing masonry joints are "concave" joints)

## How-To: Caulking Cracks and Holes (non-masonry)

1. Check the following places for cracks and holes that need caulking:
  - Between window and door frames and the main frame of the house (fig. 1).
  - Gaps in sidings and at corners of house (fig. 2). Joints formed by siding and masonry (fig. 3).
  - The underside of eaves where wall and eave meet (fig. 4).
  - The joints where steps and porches meet the house (fig. 5).
  - The surface of wood siding, trim, fascias.
2. Before applying new caulking (or putty) remove the old and wipe the area clean with a cloth soaked with a solvent similar to cleaning fluid.
3. Most joints can be caulked with the "rope form" caulking. Unwind the caulk and force it into the cracks with your fingers (fig. 6).
4. For large openings or cracks, such as gaps between lengths of siding, use "bulk" caulking and apply with a putty knife or small trowel (fig. 7). Clean away excess as you work.

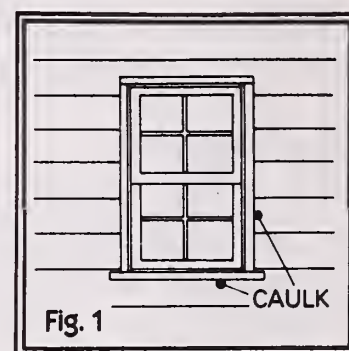


Fig. 1

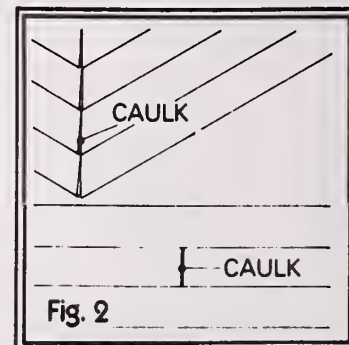


Fig. 2

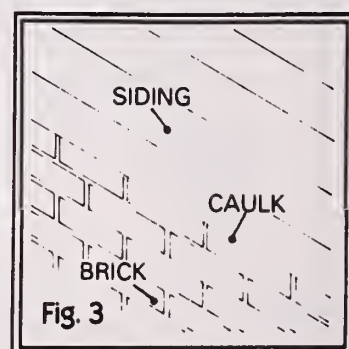


Fig. 3

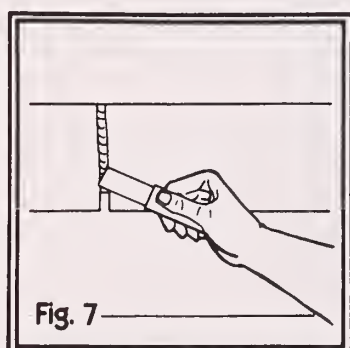


Fig. 7

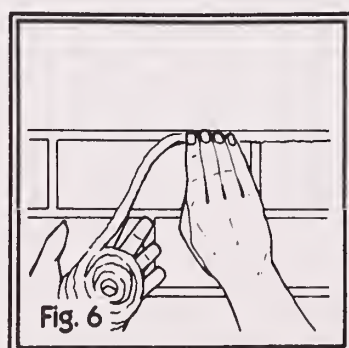


Fig. 6

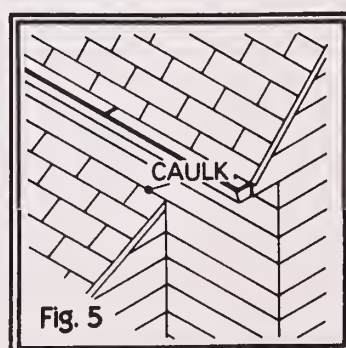


Fig. 5

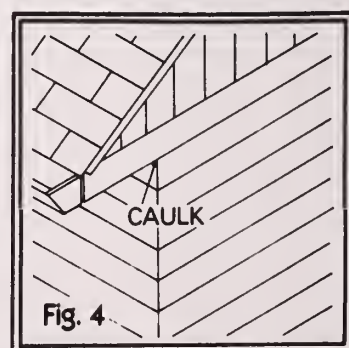
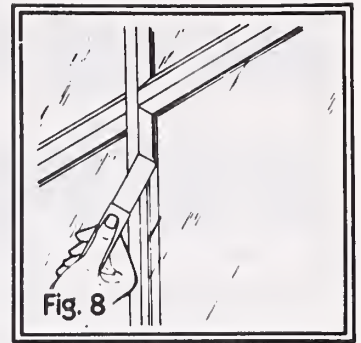


Fig. 4

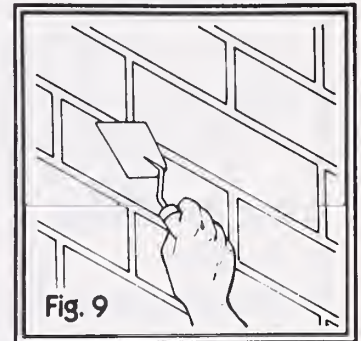
5. To seal around glass in windows and doors, use putty and apply with a putty knife (fig. 8). Lay a small roll of putty,  $\frac{1}{8}$  inch to  $\frac{1}{4}$  inch thick, around the sash or frame so that it fills the groove in which the glass rests. Make sure that the putty is fully applied to both the glass and the sash or frame. Press the putty firmly with the knife to assure a good seal. Trim away excess as you work.



6. For holes in wood surfaces, use putty and apply with a putty knife.

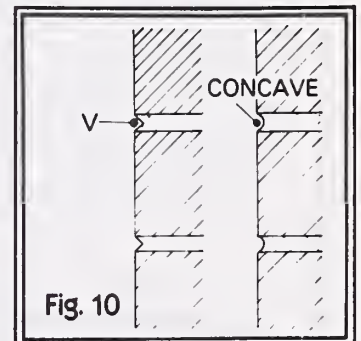
### How-To: Filling Masonry Cracks

1. Using the chisel, chip out loose mortar from all joints to be filled.  
2. Mix a batch of mortar according to the directions on the package.  
3. Wet the masonry thoroughly before you begin and keep it wet as you work.

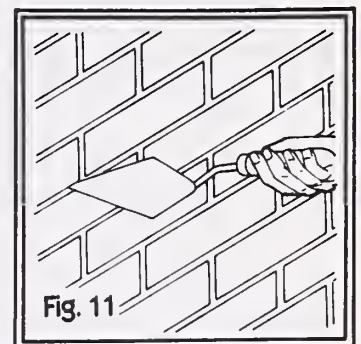


4. Apply the mortar with a small pointing trowel (fig. 9). Press the mortar firmly into the joint, making sure the joint is full.

5. Take off the excess mortar with the edge of the trowel. Now finish the joint to match the existing joints (fig. 10). You can make the V-shape with the tip of the pointing trowel. Hold the trowel at a 45-degree angle to the joint, push the tip into the joint and then firmly move the trowel along the joint (fig. 11).



You'll need a special masonry tool called a "jointer" to make a concave joint (fig. 12). The concave joint is formed by placing the jointer over the mortar joint lengthwise and pressing the mortar firmly into the joint to form the concave shape (fig. 13).

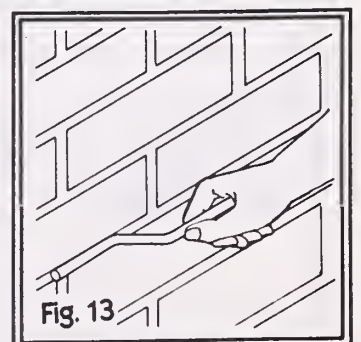
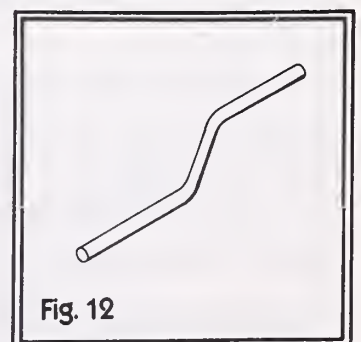


6. Fill and finish a joint (equal to 8-10 brick lengths) before you start another.

7. Keep the newly filled joints damp for 2 or 3 days by frequently wetting with a fine spray from a water hose or by covering with wet burlap.

### Your Benefits

- Lower heating bill.
- No more moisture or water damage.
- A more air-tight house.
- No more crawling insects.



# Metal Gutters and Downspouts

## Your Problem

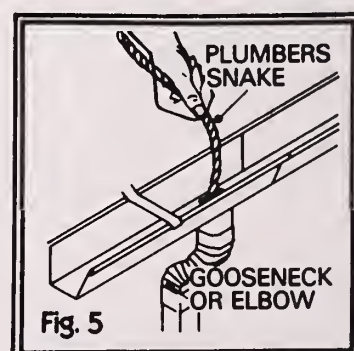
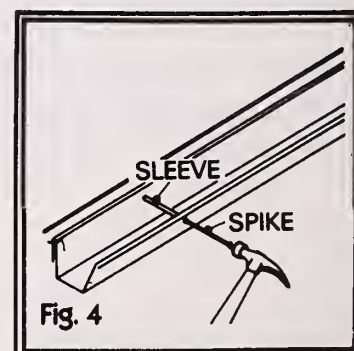
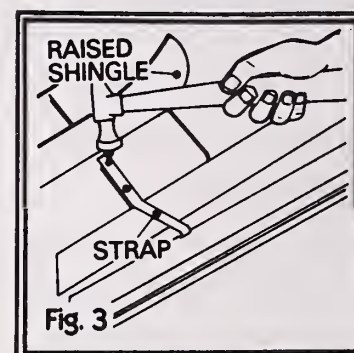
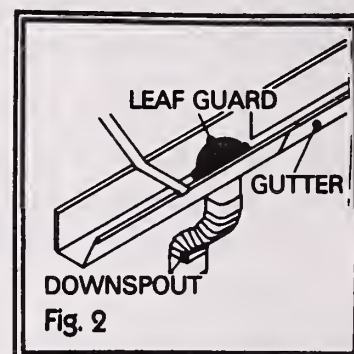
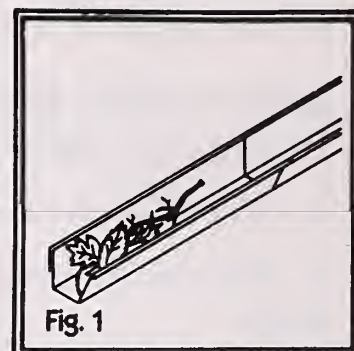
- Water stands in the gutter.
- Water overflows or spills over the edge of the gutter.
- Water leaks from the gutter or downspout.

## What You Need

- Ladder
- Metal gutter straps. (Straps must be the same type of metal as your existing gutters and straps.)
- Galvanized or aluminum spikes (if required, rather than straps)
- Galvanized or aluminum screws and nails
- Asphalt roofing cement
- Hammer and screwdriver
- Plumber's snake (or flexible metal cable, approximately 1/4 inch in diameter)
- Wire brush
- Putty knife (or flat piece of scrap wood).
- Canvas patch

## How-To: Clean and Adjust

1. Inspect and clean gutters and downspouts at least twice yearly.
2. Remove all leaves and other debris from the gutters and check for loose joints (fig. 1.)
3. Check the gutter outlet opening where the water flows into the downspout. The outlet should have either a leaf guard or leaf strainer. Clean debris from the leaf guard or strainer and replace in position (fig. 2).
4. Check all gutter hangers for tightness. If the hanger is a "strap" type and is loose, renail it with a galvanized nail or tighten it with a galvanized screw. Broken or damaged straps should be replaced (fig. 3). If the hanger is a "sleeve and spike" type and is loose, renail it with a galvanized or aluminum spike (fig. 4).
5. Pour water into each gutter, using hose or pail of water. As the water flows, check each gutter for proper pitch for water drainage and for leaks.
6. Check each downspout for water flow and leaks.
7. Should water stoppage occur in the downspout, clean the downspout at the gutter outlet using a plumber's snake or a piece of flexible metal cable (fig. 5).



8. Should the water not drain completely from the gutter, the gutter hangers should be adjusted to give proper slope to the gutter.

9. If the hanger is a strap type, lift the edge of the shingle or other roofing material to expose the strap. Remove the end of the strap from the roof (fig. 6). Then unscrew or unsnap the attached end of the strap from the gutter (fig. 7).

10. Raise the strap to a higher position on the roof and renail it to the roof with galvanized nails (fig. 8). Make certain that the new nail is located at least  $\frac{3}{4}$  inch from the old nail hole to avoid weakening the new nail hole. Cover the nailheads with a dab of asphalt cement.

11. Now raise the gutter into position and fasten the remaining end of the strap to the gutter.

12. A different procedure is required if the hanger is a sleeve and spike type. If so, you must free the gutter by cutting the spike with a hacksaw blade (fig. 9).

13. Place the sleeve in another, adjacent location, at least  $\frac{3}{4}$  inch from the old location, raise the gutter, and refasten it to the roof board by nailing a new galvanized spike through the sleeve and into the board (fig. 4).

### How-To: Repairing Small Leaks

1. Once you locate the leak, use the wire brush to clean the area of the leak free of loose metal and rust (fig. 10). Then wipe clean with a cloth.

2. Using the putty knife, apply asphalt roofing cement over the leak area and spread it with the knife (fig. 11).

3. If the crack or hole is greater than  $\frac{1}{4}$  inch, use the technique described in the following two steps.

4. Cut a small piece of canvas  $\frac{1}{2}$  inch to  $\frac{3}{4}$  inch larger than the hole.

5. Apply a thin layer of roofing cement over the leak area. Place the canvas patch over the cement and press it firmly. Now apply a second heavy coat of cement, fully covering the patch (fig. 12).

6. Clean the putty knife with solvent or a similar cleaning fluid.

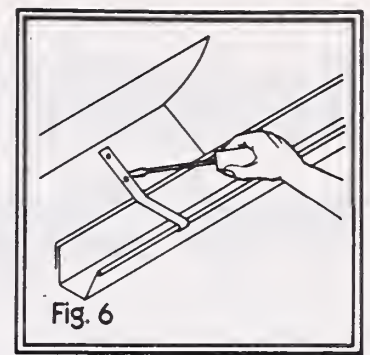


Fig. 6

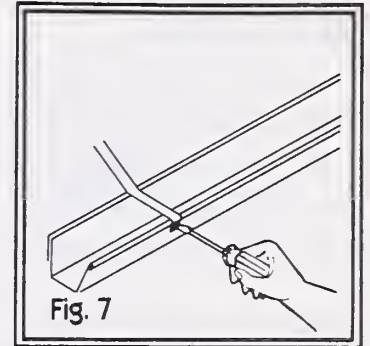


Fig. 7

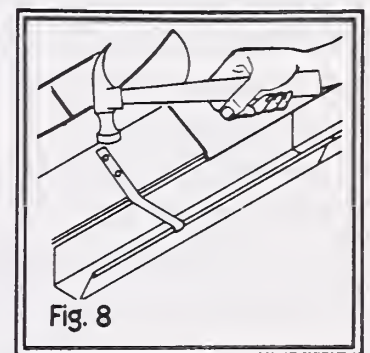


Fig. 8

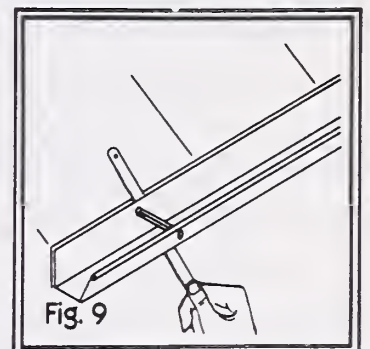


Fig. 9

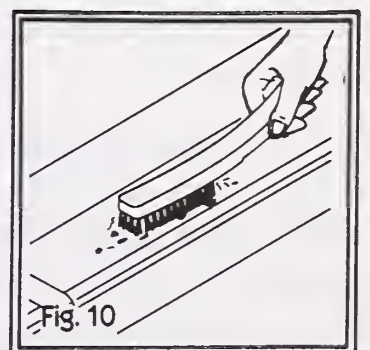


Fig. 10

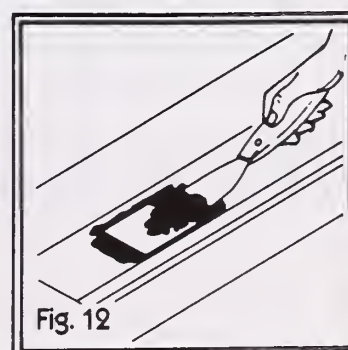


Fig. 12

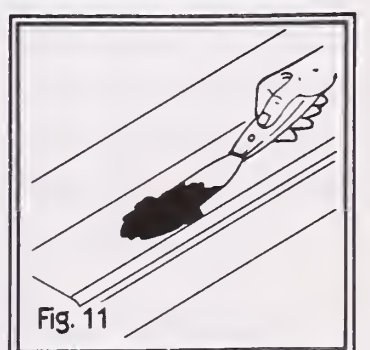


Fig. 11

# Splash Blocks and Drywells

## Your Problem

- Water discharged from the downspout to the ground does not flow away from the wall of the building.
- Water standing near the building can damage the foundation or cause damp basement walls.
- Water is standing in crawl spaces.

## What You Need

- Splash blocks, if they are to be used (one for each downspout). The following items, if a drywell is to be used:
- Drainage pipe (tile or vitrified clay)
- 55-gallon drum
- Assorted rocks, large gravel and old cinder blocks
- Cement mortar
- Steel punch and hammer
- Keyhole saw (with plumber's saw blade)

## How-To: Use of Splash Blocks

1. Place a splash block on the ground directly under each downspout (fig. 1). Instead of splashing on the ground, the water falls on the splash block and is directed away from the building. For best results, make sure the length of the splash block extends at least 3 feet from the house and that the grade slopes about 6 inches in 10 feet.

2. Check the proper positioning of the splash blocks each time you inspect and clean the gutters and downspouts. Splash blocks will tend to settle into the ground over a period of time (fig. 2). If they've settled, rebuild the ground back to its original surface and replace the splash block.

## How-To: Use of Drywells

Similar to splash blocks, drywells collect water from the downspouts. But, unlike splash blocks, drywells spread the water over a larger ground area, and at a greater distance from the wall of the house.

When should dry wells be used? First, be reasonably sure that the soil is of a type to sufficiently absorb the water. Second, downspouts are connected to a drywell only when public underground storm water systems are not available. You can build a drywell as follows:

1. Place the drum flat on the ground, either end up. Using the hammer and steel punch, make a hole in the end near the edge (fig. 3). Insert the

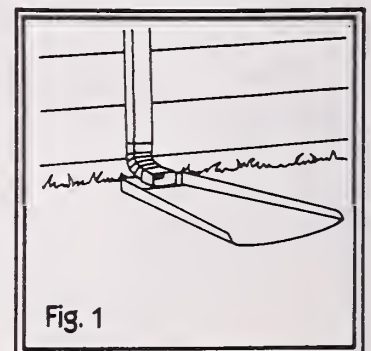


Fig. 1

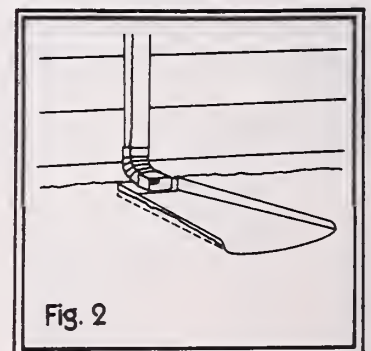


Fig. 2

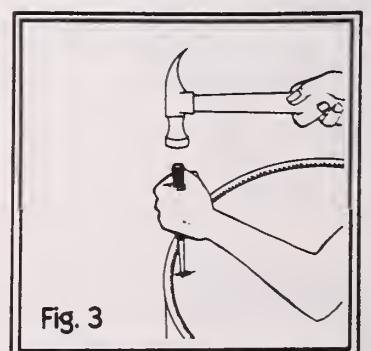


Fig. 3

keyhole saw in the hole and cut out and remove the end. Save this end piece (fig. 4). Remove the other end of the drum the same way.

2. Punch a series of holes (approximately 6 inches to 7 inches apart) around the surface of the drum (fig. 5). Now cut a circular opening in the drum large enough to receive the drainage pipe. The opening should be approximately 6 inches from one end of the drum (fig. 6).

3. Dig a hole in the ground large and deep enough to bury the drum (fig. 7). Place the drum upright in the hole.

4. Dig a trench from the downspout to the drum. Lay the drainage pipes in the trench from the downspout to the drum opening (fig. 8).

5. Fill the drum with rocks, gravel and cinder blocks. Now put one of the ends that was cut out of the drum back in place on top of the drum.

6. Fill the drum hole and the trench with the excavated earth, bringing the ground back to its original surface and level.

7. Seal the downspout-underground drainage pipe connection with cement mortar (fig. 9).

### Your Benefits

- Elimination of water puddles.
- Less surface water near the building.
- Protection of foundation and basement walls against dampness and infiltration of surface water.

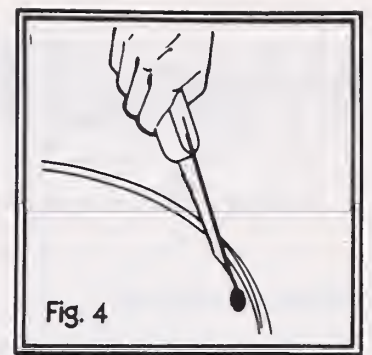


Fig. 4

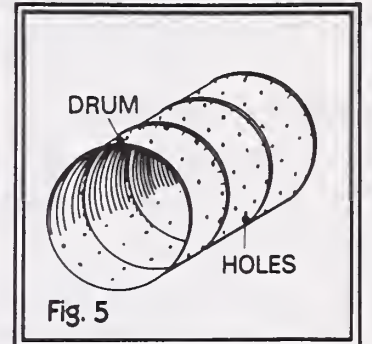


Fig. 5

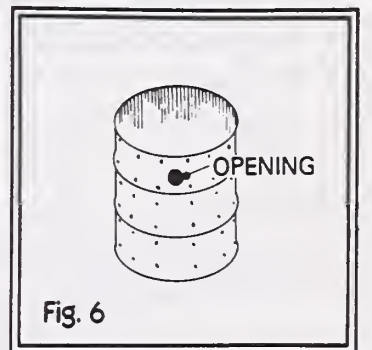


Fig. 6

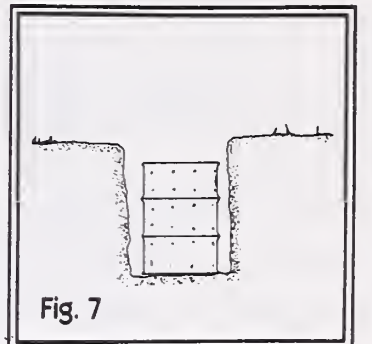


Fig. 7

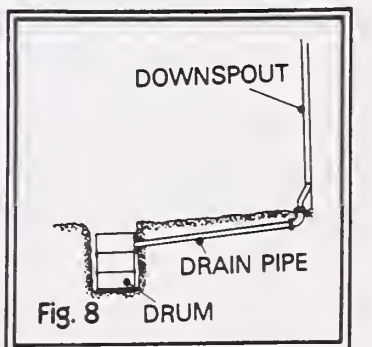


Fig. 8

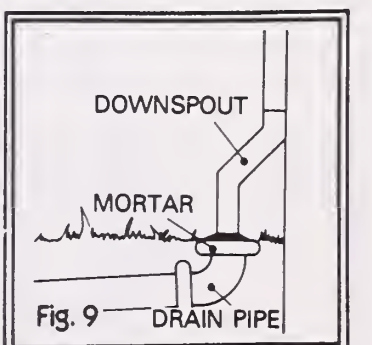


Fig. 9

# Wood Porch Flooring

## Your Problem

- Boards or planks are broken.
- Boards or planks have holes or are badly splintered.
- Wood flooring has deteriorated and is becoming unsafe and unsightly.

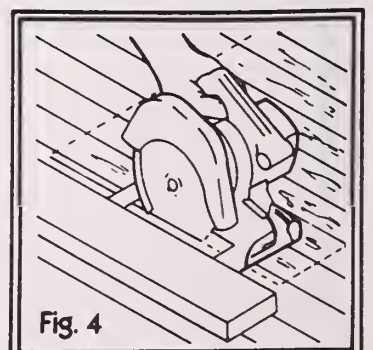
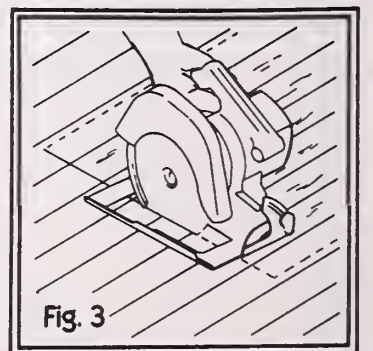
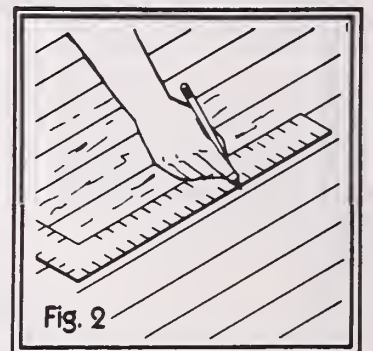
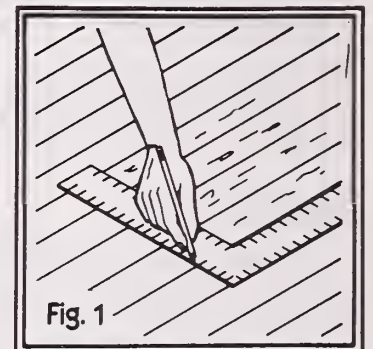
## What You Need

- Portable circular saw
- Crosscut saw and wooden miter box (or crosscut saw set into a steel miter box)
- Framing square (blade that is 24 inches long)
- Wood chisel (blade at least 2 inches wide)
- Heavy-duty pry bar
- Replacement flooring (type, kind, and thickness to match existing flooring)
- Nails

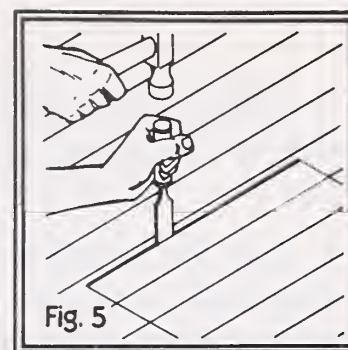
## How-To:

The following procedures are based on tongue-and-groove flooring laid on a subfloor.

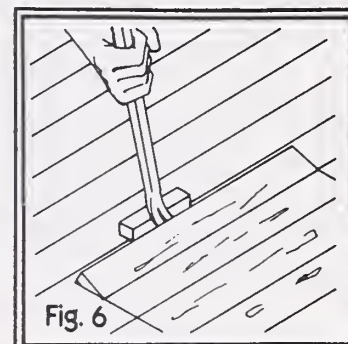
1. Examine the damaged boards and decide how much flooring must be removed.
2. The porch flooring will commonly have tongue-and-groove and be laid on a sheathing subfloor. Determine this before you begin.
3. Mark the area to be repaired, using the square and a pencil (fig. 1). This mark should be approximately  $\frac{1}{2}$  inch from the crack to avoid hitting the nails (blind-nailed) with the saw blades (fig. 2). Carefully adjust the blade of the portable saw to the thickness of the flooring to avoid cutting the subflooring. Place the saw at the center of the end mark, slightly tilted, with the blade resting on the flooring (fig. 3). Make the cut to the corner of the marked area. Cut the opposite end the same way.
4. Make the side cuts of the marked area in a similar manner. To assist in guiding the saw, nail a strip of wood next to the pencil mark. You may now slide the saw along the edge of the strip as you make the cut (fig. 4).



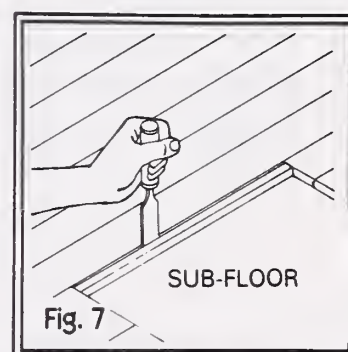
5. Using the hammer and chisel, finish the cuts down to the subfloor (fig. 5). Using the pry bar, and a small block for leverage, lift out the boards to be removed (fig. 6).



6. At each side of the opening, small strips remain that resulted from offsetting to miss the nails in the flooring. Using the hammer and chisel, carefully remove these strips, making sure not to damage the tongue of the good board (fig. 7).



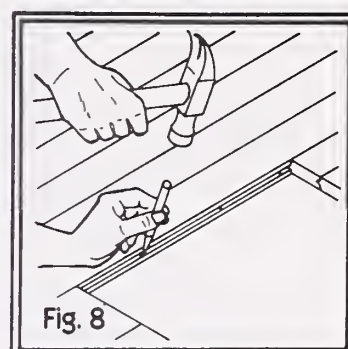
7. Using the nail set, sink the nailheads that now protrude at each side of the opening (fig. 8). The area is now clear for placing the new flooring. The flooring will be supported by and attached directly to the subfloor joists.



The following procedures should be used for porch flooring without a subfloor: In steps 3 and 4 above, the end marks and end cuts must be made at the center of the joist width so that the flooring can be properly supported (both new and remaining flooring) (fig. 9).

8. The best method of locating the joists is to tap the flooring with a hammer until you hear a “solid” sound, indicating the location of the joist underneath.

9. After you have located the joists, proceed with step 3 above. When you make the cut, be careful not to cut the tops of the floor joists. Remove the damaged pieces from the ends with a pry bar (step 5).

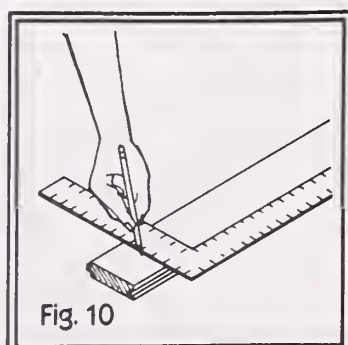
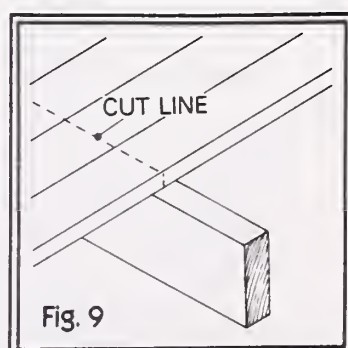


### Removing Square-Edge Flooring

If the flooring is of the square-edge type rather than tongue-and-groove, the boards need be marked and cut only at the ends. After the ends are cut, take the hammer and nail set and drive the nails completely through the boards of the area to be removed. Now apply the pry bar at one end of the cut boards, being careful not to damage the boards that are to remain.

### How-To: Replacing the Damaged Flooring

1. Measure the length of the cut-out opening of the floor. Using the square, mark this cut line on the new board (fig. 10).



2. Place the board in the miter box with the hand saw placed at the 90 degree miter (fig. 11). Make the cut just slightly to the outside of the cut line.

3. Lay the board in the opening. Blind-nail it in place by driving the nails diagonally just above the tongue of the board (fig. 12). Complete the nailing with the nail set. Space the nails the same distance they were spaced in the existing flooring.

4. Place the remaining boards in a similar manner until you get to the final board to be replaced. The final board must have the tongue removed (fig. 13). You will now face-nail this last strip and countersink the nails. Fill the nail holes with wood filler and wipe away the excess with a cloth soaked with solvent. Finish the surface of the new flooring to match the rest of the floor.

### **Your Benefits**

- The bounce and shakiness is removed from your porch.
- Floor is safer to walk on.
- You can prevent later, more costly repairs.

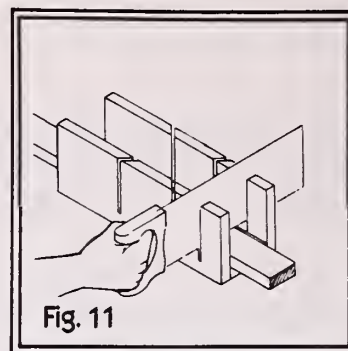


Fig. 11

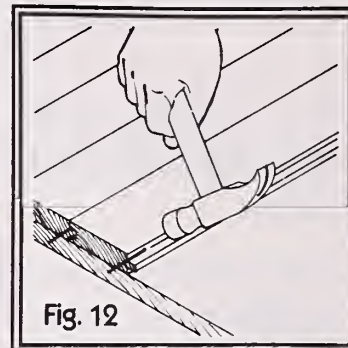


Fig. 12

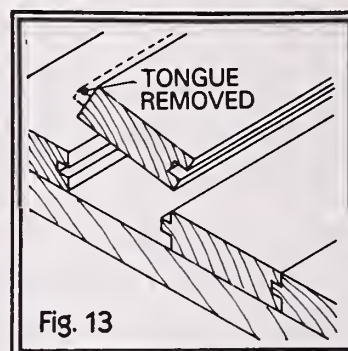


Fig. 13

# Wood Steps

## Your Problem

- Treads or risers are loose, sagging, broken, warped, or worn out.

## What You Need

- Replacement stock should be pressure-treated wood
- Claw hammer and 8d finishing nails
- Crosscut saw
- Framing square
- Chisel
- Pry bar
- Nails—6d to 10d depending on the thickness of stock to be used.

## How-To:

If your steps consist of the “open-riser” or “plank” type, make repairs using the following procedures:

1. Strike the underside of the damaged tread with moderate blows of the hammer. If nails pop up, pull them out with the claw of the hammer. If not, continue to remove the tread by striking the underside (fig. 1). Remove or sink any nails that protrude from the stringer.

2. Measure the tread to be replaced. Mark this on the replacement board. With the square aligned at the edge, mark the cut line (fig. 2). Make the cut with the crosscut saw.

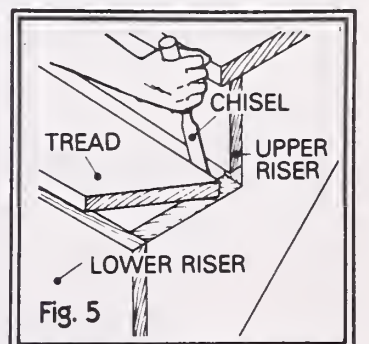
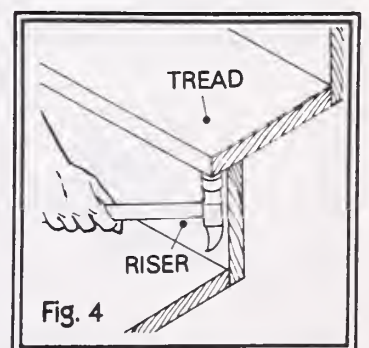
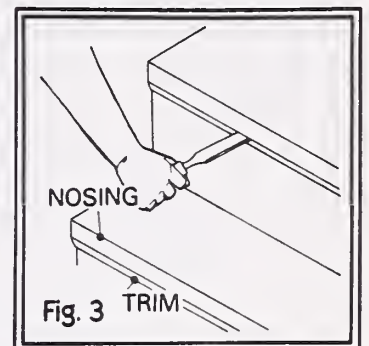
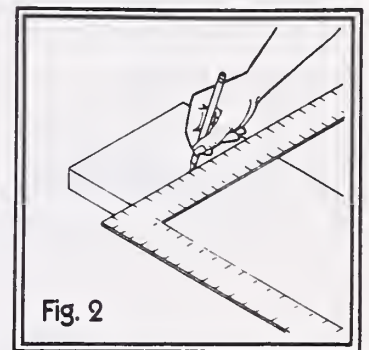
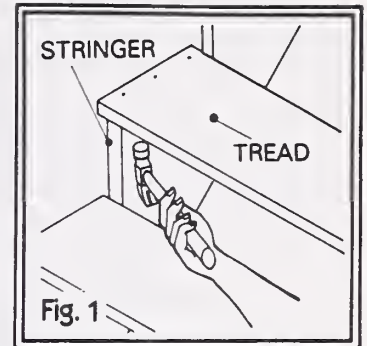
3. Now put the new tread in place and nail it, using 8d nails. Use at least three nails at each end of the tread, one near each edge of the tread and one near the center.

4. If the steps have closed risers, the following variation in the procedures should be followed.

5. The steps may have a piece of trim running along the upper portion of the riser and under the nosing (tread extension) of the tread. If so, using the chisel or pry bar, remove it (fig. 3).

6. Now using the hammer, carefully strike the underside of the tread at the nosing to free the tread from the riser below (fig. 4). Use the chisel or pry bar at this point to pry up the tread. The tread will also be secured at the sides to the stringers.

7. After the front and sides of the tread are free, pull the tread forward carefully and evenly, to free the rear of the tread from the riser above (fig. 5).



8. Remove the riser if it also has to be replaced. Begin by partially prying the riser loose from the upper tread (fig. 6). Once the nails are exposed, saw them off flush with a hacksaw blade (fig. 7). Continue by prying the riser away from stringers (fig. 8). Sink or pull any nails that protrude.

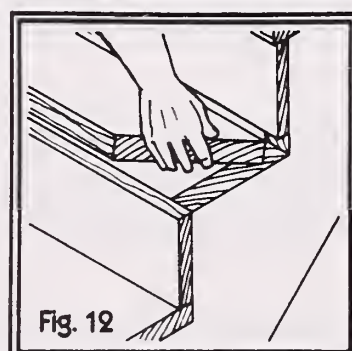
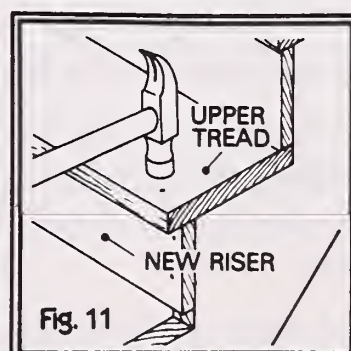
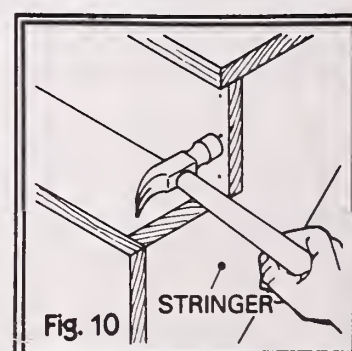
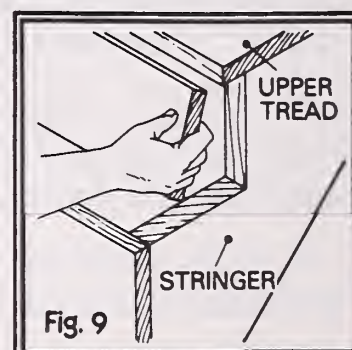
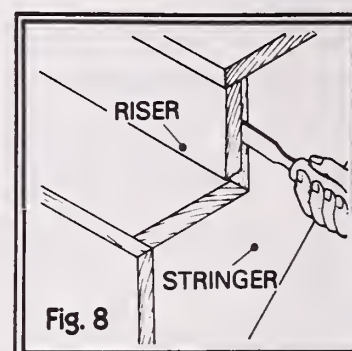
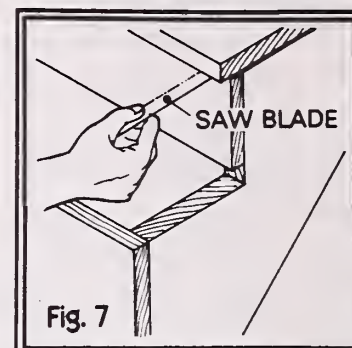
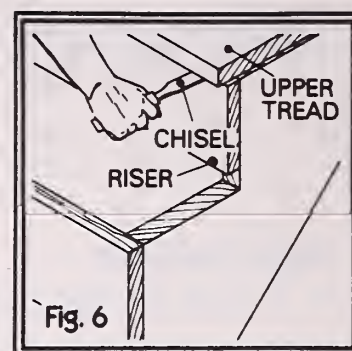
9. Measure and cut the replacement tread and riser, using the procedures in steps 2 and 3. Now proceed to place the new tread and riser.

10. Place the riser first by putting it in its location under the nosing of the upper tread and against the cutout of the stringers (fig. 9). Now nail the riser into place by face-nailing it to the stringers (fig. 10). Then nail the upper tread down on the riser (fig. 11). Space the nails the same as the old nail spacing, or approximately 6 inches apart.

11. Now place the new tread in position (fig. 12). Face-nail the tread to the riser below and to the stringers. If trim was removed, replace it at this point with 4d or 5d finishing nails.

### Your Benefits

- Steps are safer.
- Steps look better.
- No more bouncy or sagging steps.



# Cracks in Concrete Sidewalks

## Your Problem

- Small cracks in sidewalks are becoming larger.
- Uneven surfaces are dangerous.

## What You Need

- Packaged ready-mixed mortar
- Epoxy concrete ("clear" type for narrow cracks and "gray" type for wide cracks and concrete breaks)
- Wire brush
- Pointing trowel and wood float
- Heavy-duty paint brush

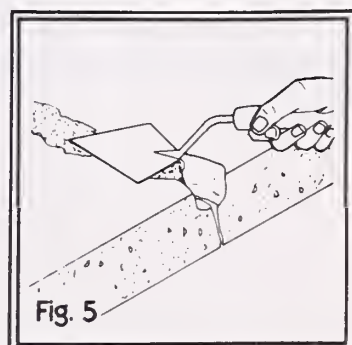
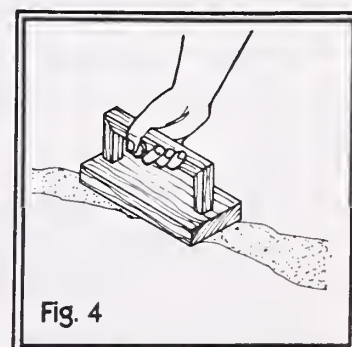
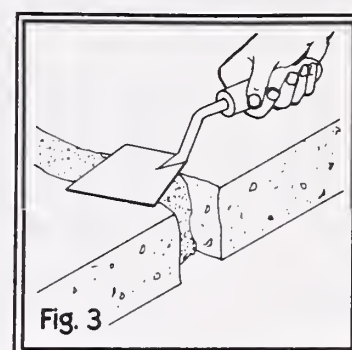
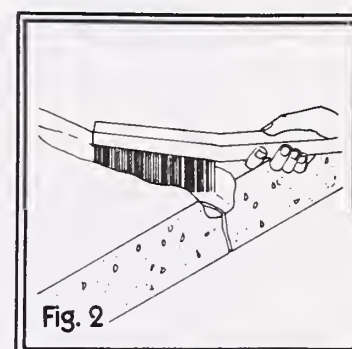
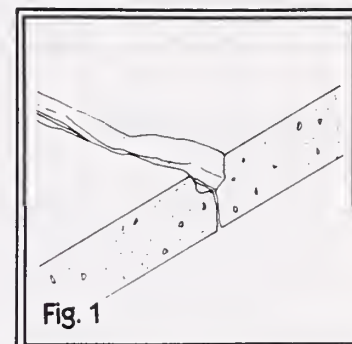
## How-To: Repairing Cracks

1. Caution! Repair only when concrete is dry.
2. Chisel out the crack or hole wider under the surface (fig. 1).
3. Clean the concrete surface thoroughly with the wire brush (fig. 2).
4. Mix a batch of mortar according to the directions on the package. Mix in the epoxy concrete with the mortar according to the direction on the epoxy container.
5. Using the trowel, put mixture into the crack (fig. 3).
6. Using the wood float, smooth the mixture even with concrete surface (fig. 4).
7. Clean the tools immediately with paint thinner.
8. Note: Work fast! Most epoxies will harden in an hour. If the patch should harden before the operation is completed, apply a second coat and smooth the surface again.

For big cracks, spread the mixture over the full width of the crack until the level of mortar is slightly above the concrete surface. If repairing a full break in the concrete, use the trowel to force the mortar mixture to the bottom of the break (fig. 5).

## Your Benefits

- A more attractive sidewalk
- Prevention of further damage
- A safer walking surface



# Termites/search and Destroy

## Your Problem

- Wood materials are threatened by termites.
- Wood materials have deteriorated.
- The house needs to be checked for the presence of termites.
- Preventive action against termites is required.

## What You Need

- Flashlight
- Penknife or icepick
- Pick and shovel
- Chemical solution (consult an exterminator to determine the type of chemicals or treatment to use).

## How-To: Checking for Termites

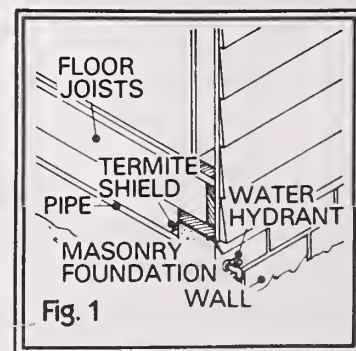
Wood decay and damage by insects are threats to the upkeep of the home.

The insects most destructive to wood in buildings are termites. There are two varieties: The “drywood” termite and the “subterranean” or “ground-nesting termite.” Both thrive on wood for food.

“*Drywood*” termites can live without moisture, so that protection against them is very difficult. However, there are not many “drywood” termites in this country.

“*Subterranean*” or “*ground-nesting*” termites are a serious problem in the southern States. Subterranean termites live in colonies in the ground and require moisture to survive. The worker termites attack damp wood which is in contact with the ground. They may build earthen tunnels from the ground up to the wood. They will sometimes completely eat away the inside of a piece of wood while leaving the outside surface intact.

1. Check for termites at least twice a year.
2. During the spring and summer (termite mating season), call an exterminator to identify large numbers of flying insects that you cannot identify.
3. Look for earthen tunnels in the following locations:
  - Along masonry foundation and basement walls
  - Around openings where pipes enter walls
  - Along the surface of metal pipes (fig. 1).
4. Examine all cracks in slabs, and loose mortar in masonry walls. Check all joints where wood meets with concrete or masonry, at walls, slabs, piers, etc.

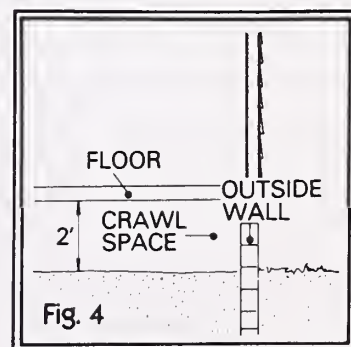
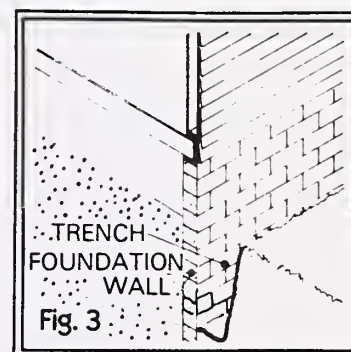
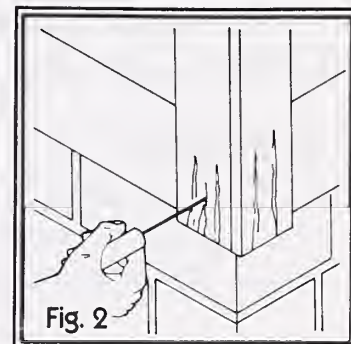


5. Inspect all wood and wood structures that are near the ground. Pay special attention to any that touch the house, such as fences, wood trellises, carports, etc. Examine crawl spaces that provide moist conditions.
6. Check windowsills, door thresholds, porches and the underside of stairs. Be on the lookout for peeling and blistering paint.
7. If you suspect that wood has termite damage, probe with a sharp point, such as an icepick or penknife (fig. 2). If the point penetrates the wood to a depth of  $\frac{1}{2}$  inch, when you use only hand pressure, it's a good indication of wood damage by termites.

### How-To: Protecting Against Termites

Chemicals needed to control termites are toxic to animals and plant life. There is also danger of contaminating the water supply. The chemicals should be applied with extreme caution and preferably by an experienced person.

1. The following procedure should be followed when chemical treatments are necessary for an existing building:
  - (a) Dig a trench, approximately 1 foot wide and 3 feet deep, adjacent to the foundation wall (fig. 3).
  - (b) Prepare a solution of the insecticide. (Consult your County Extension Office or local exterminator regarding the recommended type and mixing instructions.)
  - (c) Pour the insecticide against the exposed wall surface and into the trench as it is backfilled. The solution should be applied to all other locations where wood and masonry meet at a joint. It should also be applied to other areas that have earth floors.
  - (d) Use extreme caution with these chemicals since they will also be poisonous to humans and pets. If a chemical is used inside the house, the room or space must be well ventilated and vacated for a period of time.
2. All surface water should be directed away from the building, allowing no water to accumulate at the foundations.
3. Cover the earth of unpaved basements with plastic film 4 mil or heavier.
4. Keep crawl spaces well ventilated. A house of 1,000 square feet should have at least 8 vents, 16 inches x 8 inches, open at all times. Crawl spaces should be at least 2 feet in height (fig. 4). Keep the space clear of wood scraps.
5. Untreated wood should not come closer than 6 inches to the ground.



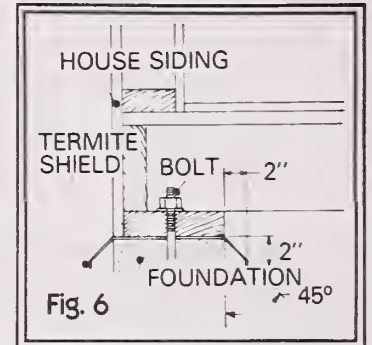
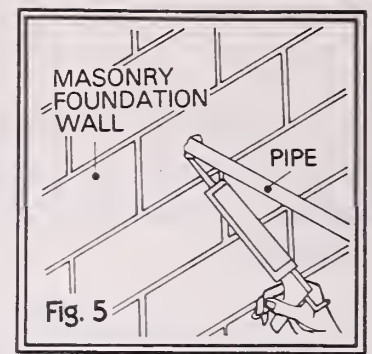
6. Using caulking compound, seal all openings where pipes pass through foundation walls or other walls of the house (fig. 5). Also, seal any cracks or points of loose mortar in masonry walls.

7. If there is a termite shield around the foundation it should be straightened and turned down (at least 2 inches) at approximately a 45-degree angle (fig. 6).

8. Make sure all scraps of lumber or stumps are removed when a building project is complete.

### **Your Benefits**

- Controlling and preventing wood deterioration in your home.
- Preventing costly repairs later.
- Assuring an attractive appearance of the wood in your home.



# Notes

